

When Mercury Fears Harm

*those fueling alarm about mercury should be held accountable
for the costs and human toll they're inflicting*

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July 2007

WHEN MERCURY FEARS HARM

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Executive Summary

The greatest risk to the health of Americans is not unsafe food, water or air, but the alarm being sounded about them. This is exemplified in the frightening scares about methylmercury ("mercury") in fish which are becoming increasingly more exigent and sensationalized. While the fears exceed anything supportable by quality science, the resulting distress, anxiety and panic is sacrificing the health and well-being of Americans in untold ways. But the human toll is rarely enumerated.

Placing monetary or precise health costs on fears has a degree of imprecision, but the body of evidence suggesting significant harm to the public from fears, anxiety and stress is far more complete than from the hypothetical risks being alleged concerning mercury, for which there is no good scientific support. And when the toll of the proposed solutions is considered, it becomes readily apparent that these fears are being fueled with utter disregard for the safety, health and well-being of Americans.

This white paper examines the other side of the fish mercury advisories — information the public rarely hears. A significant body of medical evidence has shown that today's pervasive climate of fear and anxiety surrounding our food and health is harmful to our bodies and quality of life. The resulting physiological changes suppress our immune system and lead to more infections and delayed healing, accelerate aging and worsen chronic diseases of aging, and contribute to premature death. Those with high levels of fear, for example, had triple the fatal heart attacks and six times more sudden deaths compared to those with low levels of anxiety in a two-year study from the Harvard School of Public Health.

Fears about mercury are directed at our most vulnerable — pregnant women, babies and young children — but the evidence indicates they are most harmed by fears, endangering the neurological development of babies and young children and increasing risks for pregnancy complications and preterm deliveries.

Discouraging fish consumption also eliminates the health benefits from eating fish, which help reduce those very same fear-induced health concerns among adults and growing children.

The solutions being proposed to allay the overstated dangers of mercury, namely new regulations to limit power plant emissions, are the costliest of all. Multiple experts are

delineating the hefty price tags for society, businesses and personal livelihoods. The financial hardships and resulting health problems and deaths will fall disproportionately onto our elderly, minorities, and the poor and working families. While scare mongers are never held accountable for the human suffering they inflict, an informed population will no doubt find the costs for all of us simply too great not to hold them accountable.

Missing: The full story and accountability

Warnings from governmental agencies, professional health organizations or special interest groups are believed to be looking out for our welfare and protecting us. But as they become more sensationalized and frightening, and go far beyond anything supportable by quality science, the human toll of the fears they induce far outweighs any good intentions. Yet no one is ever held accountable for such abuses of the public's trust because the full story is never told. What is never disclosed is the harm resulting from the scares themselves, such as the costs to people's health, security and well-being from the proposed safeguards and regulations being advanced in response to those fears.¹

This is illustrated in the increasingly fervid and frightening information inundating consumers about the dangers of methylmercury in our fish. The scares have spelled out dangers in increasing detail, telling millions of women of childbearing age they have dangerous levels of mercury in their bodies;²⁻⁴ that 630,000 newborns have been exposed to toxic levels that can cause mental retardation, cerebral palsy, deafness, blindness, problems with memory, and irreversible developmental and learning disabilities;⁵⁻⁷ that mercury in fish may be linked to neurological diseases such as autism, Parkinson's disease and Alzheimer's;⁸ that canned tuna contains dangerous levels of mercury and poisons children;⁹ and that to be safest, American women and children should bypass high-mercury fish completely and limit fish to one meal a month.¹⁰

Rarely enumerated are the price tags of the distress, fear, anxiety, worry or panic resulting from mercury scare mongering.

The public is left to figure out if the dangers are real and if the proposed solutions will do any good, or more importantly, if they may put themselves and their loved ones at greater risk by avoiding fish. But making such determinations is impossible when consumers only hear one side. Rarely enumerated are the price tags of the distress, fear, anxiety, worry or panic resulting from mercury scare mongering. While assigning monetary or precise health costs to fears has a measure of uncertainty, the body of evidence is far more complete to suggest significant harm to the public from fears, anxiety and stress than for the hypothetical risks

being advanced concerning methylmercury for which there is no good scientific support. And when the toll of the proposed solutions are considered, it becomes all too apparent that these fears are being promoted with complete disregard for the safety, health and well-being of Americans.

Fear is stressful

There has never been such a pervasive climate of fear and anxiety surrounding us, especially about our food and health, as there has been in recent years. We are barraged by a 24/7 drumbeat of threatening scares designed to make us feel insecure and anxious in order to sell us products, interventions or regulations which promise to offer safety. Our natural sensitivity to fear has proven easy to exploit. Even though we enjoy unprecedented levels of safety, have the most abundant supply of safe and affordable food, and are living longer, healthier lives than ever before, we've come to literally fear for our lives and believe danger is everywhere. We've become a nation afraid and one which sees the world a far riskier place than it actually is. This pervasive climate of anxiety even greater hypersensitivity to scares and feelings can never be safe enough.¹¹⁻¹⁴ When we feel afraid, naturally want more assurances of safety. But the

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we must be safeguarded from all risks is reaching pathological proportions, according to Frank Furedi, Ph.D., sociologist at the University of Kent in Canterbury.¹⁵

Our imaginations are easily spooked by the mere suggestion of possible danger, something that master filmmaker, Alfred Hitchcock, knew. Shadowy figures are far more terrifying than a well-lit villain. Those trying to scare us about our food and health know that, too. Yet even though most of our beliefs about risks aren't real, our *perceptions* of dangers are real and the resulting stress alone jeopardizes our health.

Scare mongering simply is not benign, healthful or helpful. It's normal for all of us to take fears personally. When we feel stressed, frightened or anxious, our sympathetic nervous system goes into action to increase our heart rate, shut down our digestion and trigger our adrenal glands to pump the "fight-or-flight" stress hormone, cortisol, into our bloodstream. Epinephrine is also released, which increases our oxygen intake, speeds up our breathing, increases blood flow, releases glucose, and dilates our pupils to prepare us for action. Undue stress adversely effects our body, resulting in headaches; trouble sleeping; constipation or diarrhea; irritability; problems concentrating; impaired memory; lack of energy; depression;

neck and back pain; eating problems; greater use of cigarettes, alcohol or drugs; loss of sexual desire affecting fertility; anger and increased violence; and worsened symptoms of menopause. Fears waste our time and energy. Instead of flowering, individual aspirations are hampered and creativity is restrained. Our quality of life and productivity are harmed by every symptom of pervasive stress brought on by fears.¹⁶

Over time, stress damages our health, leading to infection, disease and death.¹⁷ While initially stimulating the breakdown of fat and muscle into energy needed to escape danger, cortisol signals the body to accumulate fat for future threats. Those suffering from stress and fatigue gain weight much more easily, especially abdominal and visceral fat (around our organs) that's been linked to risks for heart disease, high blood pressure, type 2 diabetes and premature death. Such risks appear significant. For example, a two-year study by the Harvard School of Public Health following nearly 34,000 men found those with high levels of fear and anxiety had triple the fatal heart attacks and six times the incidences of sudden death compared to men with low levels of anxiety.¹⁸

Persistent stress alters our immune system causing a cascade of physiological events resulting in inflammatory responses that accelerate aging and worsen chronic diseases of aging, such as heart disease, osteoporosis and type 2 diabetes, according to William B. Malarkey, M.D. of Ohio State University. Autoimmune illnesses such as arthritis, asthma, allergies and skin problems, are also vulnerable to stress.¹⁹ People in stressful situations show prolonged healing times, a decreased ability of their immune systems to respond to vaccinations, and an increased susceptibility to viral infections, according to Esther Sternberg, M.D., director of the Integrative Neural Immune Program at NIH's National Institute of Mental Health.²⁰ Eventually, we run out of physical, mental, emotional and spiritual reserves and become exhausted.

Years of research, including that by Andrew H. Miller, M.D. of Emory University, are finding that the body's responses to stress appears to damage certain parts of the brain, impairing long-term memory and worsen depression and fatigue.^{21, 22} Chronic stress even appears to have the potential to shorten the life of cells and cause premature death, according to research led by Elissa Epel, Ph.D., at the University of California, San Francisco.²³

Fears keep us up at night

Stress and worry are the largest contributing factors to insufficient sleep in both adults and children.²⁴ The National Commission on Sleep Disorders Research, within the National Heart, Lung, and Blood Institute of the National Institutes of Health, reports that about 70 million Americans and 25 percent of children suffer from sleep problems. For nearly 60 percent of us, the problems are chronic. The Commission attributed \$15.9 billion in direct costs of sleep deprivation and an additional \$50 billion to \$100 billion in indirect and related costs such as destruction of property and accidents.²⁵ Insufficient sleep also adversely affects learning, job productivity, and career advancement. A sleepy populace makes for one that is less competitive in academics and business, but is also less healthy. According to the NCSDR, sleep disturbances are associated with neurological disorders, heart and lung diseases, mental illness and addictions.²⁶ Disturbed sleep also hinders the ability of seniors to function and live independently and is among the most frequently cited reasons for institutionalization of older Americans.²⁷

Fears bring gloom

Continual exposure to fears and anxiety leave us with a sense of powerlessness and feelings of depression. So not surprisingly, along with the escalation of fears, prescriptions for antidepressants have skyrocketed, tripling among adults here and in Canada in the past twenty years.^{28,29} The number of antidepressant drug prescriptions rose from 12 million in 1985 to 25 million in 1994. Costs of pharmacotherapy for depression have increased above the inflation rate and are expected to exceed 1.2 billion dollars in 2005.³⁰

Innocent children are especially susceptible to fears that surround them. Prescriptions for antidepressants for children have increased two to three times in just the past 15 years, with numbers significantly higher among low-income children.³¹ In fact, according to the U.S. Food and Drug Administration, about 11 million prescriptions were written in 2002 for children to treat depression.³²

Fears make us feel sick

The deluge of frightening warnings about the safety of our food and possible poisoning of ourselves and our children means we all feel more vulnerable. In fact, our mind is so powerful that when we believe we may have been exposed to something dangerous, we actually feel sick. Normal everyday symptoms such as headache and fatigue are more easily interpreted as signs of disease or ill-health and attributed to toxins.³³ A simple headache might mean an inoperable brain tumor or a scratchy throat the beginnings of SARS.

“Anxiety is very time consuming,” said Ingvard Wilhelmsen, M.D., Ph.D., one of the world’s leading authorities on hypochondriasis. “People are quite capable of thinking themselves into feeling terrible.”³⁴ The symptoms people feel are real — dizziness, pain of all descriptions, weakness, shortness of breath, nausea, palpitations — and they are honestly suffering, he said. But there is no specific organic malfunctions.³⁵

People are quite capable of thinking themselves into feeling terrible.

Such manifestations of our fears and anxiety are seen in a number of recent trends. Fears about environmental pollutants and chemicals are credited with the contemporary surge in illnesses without medical cause, such as sick building syndrome, multiple chemical sensitivity and total allergy syndrome.³⁶ The resulting unease and the belief that modern life is undermining our health and immune systems has fueled the public’s growing fears of food and obsession with health, gyms and exercise, and “healthy lifestyles.”

Sensationalized fears and increased media coverage about environmental dangers lead us to divert our efforts for better health in directions that may put us at greater risk. Fears have fostered a growth in alternative and complementary medicine which, according to the National Council Against Health Fraud, puts consumers at increased risks from unproven, unsound or potentially dangerous remedies. People are also paying more for foods and beverages they believe are safer, more pure and natural, but actually have greater risks for contamination and food-borne illnesses.^{37,38} And people afraid often ignore more important and effective health measures such as smoking cessation, wearing a helmet, buckling up or getting vaccinated, in favor of avoiding extremely remote or nonexistent dangers.³⁹

Scares ultimately divert our attention from real opportunities to enhance life and longevity. What an incredible waste of time, resources, and human potential. — former Surgeon General C. Everett Koop⁴⁰

Excessive health anxiety, called *hypochondria*, is an anxiety disorder and sufferers continually look for symptoms in themselves and their children, regularly besiege doctors, demand testing, and reject favorable diagnoses, said Dr. Wihelmsen.⁴¹ They believe they must be 100 percent certain that they are well, so they “often wind up undergoing unnecessary and invasive procedures and excessive diagnostic testing in a vain attempt to ease their anxieties,” he said.⁴²

Some experts suggest that people whose anxiety meters have run amok constitute a large percentage of Americans frequenting clinics and hospitals, imposing a strain on health care costs and resources. Stress that's transformed to physical symptoms, known as *somatizing*, and hypochondria afflict ten percent of American adults, according to Steven Locke, M.D., a Harvard Medical School psychiatric researcher. These anxious people see doctors more often, accounting for up to one-third of all primary care calls, and result in healthcare costs 14 times higher than average. His research has estimated \$30 billion annually is spent in unnecessary medical costs resulting from people who fear being sick or believe they're at risk.^{43, 44}

A growing trend among worried fish-eating consumers is biomonitoring, testing for chemicals in their bodies and breast milk. California Senate Bill 1168 introduced by Deborah Ortiz, D-Sacramento, established voluntary testing of Californians for chemicals and has fueled this trend. But women and children across the country are now getting locks of hair clipped at local beauty salons to be tested as part of a nationwide initiative by the Sierra Club to "raise awareness of mercury pollution."^{45,46} Consumers are being taken advantage of and further frightened into believing that the mere detection of something makes it dangerous. However, testing procedures are now so precise they can detect the presence of anything down to *parts per trillion*, meaningless amounts for which there is no evidence for any concern. When researchers from Harvard Medical School studied individuals labeled as "mercury toxic" after such commercial testing at spas and clinics, they found *none* of them had actual evidence of mercury toxicity.^{47,48} Testing will invariably lead to spurious personal injury lawsuits.

People feel unhealthy anytime they're told they're at risk, so hearing frightening mercury warnings that they've already been exposed makes them feel worse. "Labeling someone as 'diseased'...has enormous individual, social, financial and physical implications," said James Wright, M.D., MPH, FRCSC, surgeon and professor at the University of Toronto and Hospital for Sick children.⁴⁹ Medicine has long known that labeling someone as hypertensive, for example, is sufficient to increase absenteeism from work and iatrogenically result in loss of quality of life.⁵⁰

Fears impact innocent children

Contrary to the very best scientific evidence, groups such as the Learning Disabilities Association of America, National Education Association and the Arc of the United States, are telling parents that mercury is "one of the greatest threats facing developing fetuses, infants

and young children” and leaves as many as 15 percent of babies at risk of developmental problems.^{51,52} Parents are told that infants may be born apparently normal, but later show effects that range from being slower to reach developmental milestones to brain damage with mental retardation, incoordination, seizures, and inability to move or speak. Their parent’s guide adds that “an estimated ten percent of school children have some type of learning disability.”⁵³

As a result, parents are understandably driven to panic. Healthy infants and children are becoming the continual subject of scrutiny and parental anxiety, are undergoing unnecessary testing, and put at risk of misdiagnosis of developmental problems or “finding” behavioral problems, and victims of needless treatment. Demonstrating the impact of fear, when one child’s ability to catch a ball seemed rusty and he missed school assignments and wasn’t paying attention in class, his parents thought mercury poisoning, had him tested and proceeded to eliminate tuna from his lunches.^{54,55}

Children pick up parental fears, as well as those surrounding them. They are left anxious by the continual scary messages, even learning to be afraid of their food from images on television of poison symbols on tuna sandwiches in lunchboxes. It is stress which causes behavioral changes, mood swings, acting out, disrupted sleep, bedwetting, stomachaches and headaches in children. They also become withdrawn and their school learning is negatively affected, resulting in lowered academic performance and hampered development of healthy social relationships.⁵⁶

Growing research reported by the National Institutes of Mental Health suggests that even babies are harmed by stress. Stress experienced during the early months and years of a newborn’s life appears to affect the child’s developing brain. Excess cortisol may cause shrinking of the hippocampus, a brain structure required for the formation of certain types of memory, the NIMH suggests. In animal studies, the young exposed to early stress were abnormally anxious in new or stressful situations and this hypersensitivity to stress persisted even into adulthood.⁵⁷

Fears especially endanger expectant mothers and unborn babies

Fears about mercury are directed at expectant mothers — the very people most harmed by fueling additional fears and anxiety. Pregnancy is naturally an especially stressful time for most young women as they worry for themselves and the innocent life in their care. While

normal stress is unlikely to cause problems for most pregnant women, a number of studies have indicated that high levels of stress may increase the risk for preterm birth or low birth weight in even full-term babies, according to the March of Dimes. "Stress-related hormones (such as norepinephrine) may constrict blood flow to the placenta, so the baby may not receive the nutrients and oxygen it needs for optimal growth," they caution. Studies also suggest that high stress levels contribute to pregnancy complications such as preeclampsia (a pregnancy-related disorder that includes high blood pressure and can result in poor fetal growth and other problems) and miscarriage. Prematurity is the leading cause of death in the first month of life and a major contributor to disability, they caution. Babies who survive may suffer lifelong consequences, including cerebral palsy, mental retardation, chronic lung disease, and vision and hearing loss.⁵⁸

The growing use of scare tactics may have contributed to the largest increase seen in U.S. history of preterm births between 1981 and 2001. Preterm deliveries now account for 11.9% of all births. While impossible to itemize, fears play some role in this worrisome trend, either directly or leading frightened women to change their eating and health habits in ways that may put themselves and their babies at greater risk. The total national bill for hospital costs caring for premature and low birth weight babies has been estimated at \$11.9 billion.⁵⁹ Employers pay nearly 15 times more for babies born prematurely than for term babies, with an average cost of \$14,610. Besides the direct cost to businesses, premature birth also causes lost productivity. The Thomson Medstat analysis found that premature babies spend nearly 17 days in the hospital over the 12 months following birth, compared to 2 to 3 days for healthy, full term babies and they visit the doctor's office 50 percent more often. All of this means more time away from work for parents. Mothers of premature babies averaged 29.1 days away from the office over the six months following delivery, compared to 18.9 days for mothers of full-term babies.⁶⁰

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Fears and stress cost financially

We all pay for the consequences of exaggerated fears being told at every turn. The resulting stress and anxiety costs society, businesses, and even our personal bank accounts. While multiple groups have estimated the hefty price tags, rarely are those fueling fears and anxiety held answerable.

A 1996 WHO survey found the impact of stress on businesses and society include mistakes, accidents, lost productivity, burnout, low morale, job turnover, increase in substance use, violence, harassment, one million absentee days per year, and adds \$2700 to \$7500 in annual costs for each worker.⁶¹

Nineteen percent of absenteeism, 40 percent of job turnover, ten percent of medical costs of prescription drug plans, and 60 percent of workers' compensation awards are due to stress, reported Ravi Tangri, MSc, MBA, director of the business strategies consulting firm, Chrysalis Performance Strategies, Inc. based in Halifax, NS, Canada.⁶² Unanticipated absenteeism, alone, is estimated to cost American companies \$602.00/worker/year and the price tag for large employers could approach \$3.5 million annually, according to the American Institute of Stress.⁶³

Stressed, anxious workers are not only less productive, they make more mistakes. Sixty to 80 percent of accidents on the job are stress related and as those from Three Mile Island and Exxon Valdez disasters demonstrated, they can affect untold thousands. For increasing numbers of workers, stress becomes too much. Double digit increases in Workers' compensation premiums every year as a result of mental stress claims threaten to bankrupt the system in several states, according to the American Institute of Stress. In California, the number of Workers' compensation claims for mental stress increased by almost 700 percent over eight years, with the average award \$15,000, considerably higher than the national average of \$3,420. In 1987, California shelled out almost \$1,000,000,000 for medical and legal fees alone.⁶⁴

Stress-related health problems are contributing to rising healthcare costs. In fact, health care expenditures are nearly 50 percent greater among those who report high levels of stress.⁶⁵ While rising healthcare costs are a complex and growing nationwide concern, the problem is especially acute for America's poor and working families who can least afford higher healthcare costs. About one in six families already spends more than one-twentieth of their income on health care.⁶⁶ And at least 8 to 21 percent of American families are falling behind in their medical bills, according to a recent NPR/Kaiser Family foundation/Kennedy School of Government survey. Medical debt interferes with access to care, especially preventative care.⁶⁷⁻⁷¹ In 2001, 1.458 million American families filed for bankruptcy, and half cited medical bills as the reason. A study led by Harvard Medical School professor of medicine, David Himmelstein, M.D., found about 1.9–2.2 million Americans (filers plus their

dependents) suffer the effects of medical bankruptcies which include such privations as going without food, telephone service, electricity, and health care.⁷²

What we lose

These scary warnings about dangers from mercury discourage fish consumption but don't consider the more serious health problems they may bring on by the loss of the *benefits* offered by fish.⁷

Fears sacrifice healthful benefits

More than two billion people worldwide, depend upon marine sources for a substantial part of their dietary protein. "Fish is a food that is a very important part of the healthy diet," said James Heimbach, Ph.D., FACN, former associate administrator of the U.S. Department of Agriculture's Human Nutrition Information Services.⁷⁴ Both the American Heart Association and the American Dietetic Association, representing also the dieticians of Canada, have been recommending consumers actually increase consumption of fish to two to three times per week.^{75,76} These health organizations have recommended canned tuna, salmon, and sardines as inexpensive and widely available sources of quality protein that's low in saturated fats; rich in B vitamins; antioxidants such as vitamin E and selenium; and rich in minerals such as iron, zinc and calcium.⁷⁷ Several medical experts speaking to the FDA Food Advisory Committee on Methylmercury meetings July 24–25, 2002, spoke of the importance of not deterring consumers from canned tuna, the most popular fish for American consumers for more than forty years, and the one most affordable, available and easy-to-prepare for most of us.⁷⁸

Yet, a July 27, 2005 article in San Diego's *Union-Tribune*, reported that mercury fears have already resulted in dramatic drops in tuna consumption. In the past 16 months, since "the barrage of bad publicity about mercury," Americans have reduced their tuna consumption by ten percent, resulting in a loss of nearly \$150 million in revenue for the tuna industry.⁷⁹

Epidemiologists with the Alaska Division of Public Health, Anchorage have expressed concerns that decreased fish consumption and substitution of foods that may be less healthy could have adverse health consequences. "General recommendations for limiting fish consumption are ill-conceived and potentially dangerous," they said. "Extensive scientific research has documented the numerous health, social and cultural, and economic benefits of eating fish."^{80,81}

While most mercury warnings are specifically directed at pregnant women and young children, they are the population put in the greatest peril by decreasing their consumption of fish.

A 1992 health survey of 426 Inuit adults in Nunavik suggested that their low rates of heart disease deaths might be due to their traditional fish-based diet.⁸² John Middaugh, M.D., state epidemiologist with the Alaska Division of Public Health told the FDA that fish comprise about 60 percent of the rural Alaskan's traditional diet and after the 2001 mercury advisory many communities were abandoning traditional fish-based diets with tragic consequences:

There are the risks of not eating the traditional foods. There are also many sociocultural benefits of traditional foods, what food is to a culture. The Alaskan native people have...identified values of the subsistence reliance on traditional food and fish as physical fitness, recreation, the healthy foods, being in tune with nature, sharing, that it saves money and the value to their culture. Also, pride and confidence. For their children, their education, the natural environment, survival skills, food preparation techniques, practicing patience and respect. The subsistence lifestyle and diet are of great importance to the self-definition, self-determination, cultural and socioeconomic, and overall health and well-being of indigenous peoples.... Native elders have also expressed concerns that the fear associated with the contaminants may cause greater harm.... Experience in Alaska has documented adverse effects on public health and communities from fish advisories with subsequent abandonment of traditional diets. Alaska natives are experiencing a major increase in the prevalence of diabetes. Heart disease rates are increasing, and recent studies have documented vitamin A and D deficiencies.⁸³

The most vulnerable have the most to lose

While most mercury warnings are specifically directed at pregnant women and young children, they are the population put in the greatest peril by decreasing their consumption of fish.

During pregnancy and new motherhood, some of the scariest times for most young women, they are especially sensitive to health advice. Understandably, they have been most alarmed by these warnings. A recent Harvard study found that after the well-publicized 2001 mercury advisory, pregnant women in eastern Massachusetts dramatically reduced their consumption of dark meat fish, canned tuna, and white meat fish, resulting in about 1.4 fewer servings of fish per month. And declines are ongoing.⁸⁴ Charles Santerre, Ph.D. of Purdue University

reported that among the low-income women of childbearing age in his studies, about one-third of them *hadn't eaten any fish at all in the past year*.⁸⁵

These trends are a very real public health concern and could have heartbreaking effects for young women and children. For more than a decade, the American College of Obstetricians and Gynecologists has encouraged women to enjoy two to three servings of a wide variety of fish each week to ensure healthy babies. In a testimony to the FDA Food Advisory Committee on Methylmercury, former ACOG chairman on obstetrical practices (<http://info.med.yale.edu/obgyn/mfm/lockwood.html>), Charles Lockwood, M.D., said fish has abundant health benefits and may improve pregnancy health outcomes and fetal growth, and reduce the risk of preeclampsia and premature labor. Many fish are also sources for the omega-3 fatty acid, DHA (docosahexaenoic acid), critical in the diets of pregnant women and nursing babies to ensure vision, behavioral and cognitive development.⁸⁶

The need to encourage, not discourage, fish consumption in pregnant women has been highlighted in a number of recent studies, showing benefits in fish for the developing baby and for helping women carry their babies to term.

A review of the evidence by researchers at Colorado State University, Fort Collins, Colorado concluded research suggests that increased dietary long-chain omega-3 fatty acids may decrease the incidence of premature delivery and that current intakes during pregnancy may be inadequate.⁸⁷ Any reduction in premature births has important ramifications, lending import to greater fish consumption among pregnant women. A randomized, double-blind, controlled, clinical trial at the University of Kansas Medical Center of nearly 300 pregnant women to determine the effects of increasing DHA intake during the third trimester of pregnancy found a 6-day longer period of gestation in the higher DHA group. Birth weight, length, and head circumference increased, although did not reach statistical significance.⁸⁸

A randomized controlled trial led by Sjurdur Olsen, M.D., Ph.D., of Aarhus University in Denmark reported that healthy Danish women who received fish oil during the 30th week of pregnancy carried their babies about four days longer than those who received no fish oil, suggesting fish may help reduce the risk of low birth weight or premature births.⁸⁹ Four later randomized trials by these researchers of high-risk pregnant women who had previously had premature babies or low birth weight babies, pregnancy-induced hypertension or were carrying twins, found fish oils reduced the recurrence of pre-term deliveries, although had no effect on the other outcomes.⁹⁰

Pregnant women wanting to give their baby the best start possible, have special reasons to eat a diet rich in a variety of seafood. The Avon Longitudinal Study of Parents and Children, which analyzed 7,400 mothers and their babies, found a subtle but consistent benefit between eating fish during pregnancy and infants' cognitive development and word comprehension at 15 and 18 months. According to lead researcher, Julie Daniels, Ph.D., of the University of North Carolina, Chapel Hill:

Pregnant women wanting to give their baby the best start possible, have special reasons to eat a diet rich in a variety of seafood.

Fish intake during pregnancy has the potential to improve fetal development because it is a good source of iron and long chain omega fatty acids, which are necessary for proper development and function of the nervous system. Fish, especially oily fish, is a dietary source of eicosapentaenoic (EPA) and DHA, which are important in the structural and functional development of the brain in utero and through the first year after birth.⁹¹

Chilean researchers found alpha-linolenic acid and DHA deficiencies in babies diets appear to affect their sleep-wake cycles and heart rate rhythms, and that essential fatty acids, specifically DHA, has a critical role in the visual and neurological development of babies. "Our results indicate that omega-3 long-chain polyunsaturated fatty acids should be considered provisionally essential for infant nutrition."^{92,93}

While fish offer a range of nutrients and researchers don't know yet which specific ones may prove to be the most critical, these omega-3 fatty acids appear significant. Fish is the major food source of EPA and DHA and in the form most bioavailability to our bodies. Although some linolenic acid from seed and vegetable sources is converted to the longer-chain omega-3 fatty acids, the extent of this conversion is modest and controversial, with researchers reporting a mere 0.2% to 15% conversion. That makes fish in the diet of women who are pregnant or breastfeeding, and for young children, fundamental.⁹⁴

A review of the research on the relationship between essential fatty acids, especially DHA, and neurological function in babies found the results so impressive they prompted a nursing practice journal to urge: "Because pregnancy and lactation are key times of rapid brain growth for the developing fetus and infant, nurses can be instrumental in teaching pregnant and lactating women diet-related information and promoting practices that help increase DHA levels."⁹⁵

Yet women being frightened that mercury and methylmercury can pass to their babies through their breastmilk, could be deterred from breastfeeding their babies, even those who had wished to breastfeed. This could adversely affect mother-infant bonding and deny babies the benefits — health, nutritional, immunologic, developmental, psychological, social, economic, and environmental — of breast milk as recognized by the American Academy of Pediatrics.⁹⁶

Aging adults risk more chronic diseases and early death

Adequate intakes of fish in our diet appear important to help prevent and temper a number of chronic diseases of aging, and those most responsible for premature death.⁹⁶ So health experts are increasingly concerned at what may befall us as more adults and elderly are frightened away from following medical advice to eat more fish. We could see rising incidences of a number of chronic diseases and a reversal of the positive health gains made over recent decades.

For more than thirty years, epidemiological studies in both men and women at risk for cardiovascular disease have found that those who eat a variety of fish correlate with reduced risks for heart disease, sudden cardiac deaths, strokes and premature deaths. While socioeconomic, lifestyle and other factors may in part account for such associations, the American Heart Association estimates the 250,000 heart attack deaths each year in this country could be cut in half if adults just ate fish twice a week.⁹⁸ According to Penny Kris-Etherton, RD, Ph.D. of the American Heart Association Nutrition Committee, in her testimony to the FDA:

Health experts are increasingly concerned at what may befall us as more adults and elderly are frightened away from following medical advice to eat more fish.

Some evidence ... shows decreased incidence of sudden death, reduced arrhythmias, antiplatelet effects which protects against thrombosis, marked triglyceride lowering such that omega-3s are used by some physicians in hypertriglyceridemic patients, reduced coronary disease, morbidity and mortality. EPA and DHA have cardioprotective effects.⁹⁹

Let's look at some of this evidence. A population study of 5,200 women with type 2 diabetes in the Nurses' Health Study found an inverse relationship between eating fish and incidences of heart disease and total mortality. The women eating fish one to four times a week had 36

to 40 percent the heart attacks or heart disease deaths as compared to women who seldom ate fish.¹⁰⁰

EPA and DHA found primarily in fish appear to have strong anti-arrhythmic actions on the heart, according to William E. Connor, M.D., with Clinical Nutrition and Lipid Metabolism at Oregon Health Sciences University, Portland. Sudden cardiac deaths kill another 100,000 Americans each year and fish may prevent many of these deaths, he told the FDA.¹⁰¹ Among men without a history of heart disease followed for 17 years in the Physician's Health Study, eating fish at least once a week was associated with a 51 percent reduction in sudden cardiac death compared to men eating minimal amounts of fish.^{102,103}

Fish may offer special benefits for certain people — benefits that could be lost as growing numbers become frightened away from enjoying fish.

- The strongest confirmation of cardiovascular benefits from fish and omega-3 fatty acids has come from three randomized clinical trials among patients with pre-existing coronary artery disease. The most notable of these was a randomized clinical trial in Italy of 5,654 heart patients. After 3.5 years, those taking omega-3 fatty acids had experienced a 20 percent reduction in overall mortality and a 45 percent decrease in risk for sudden cardiac death.¹⁰⁴⁻¹⁰⁶

- Women eating fish two or more times a week and followed for 14 years in the Nurses' Health Study had half the risk for thrombotic strokes compared to women eating fish just one to three times a month.¹⁰⁷

- HIV medications increase blood lipids, which some doctors believe puts these patients at higher risk for heart problems or diabetes. French researchers conducted an 8-week randomized, double-blind clinical trial of fish oils for 122 HIV-positive patients and their LDL, or "bad" cholesterol, and triglyceride levels were significantly reduced.¹⁰⁸

- Continuing research is also suggesting that the immune system may be boosted by the omega-3 fatty acids found in a variety of fish, which may ameliorate rheumatoid arthritis, asthma, lupus, kidney disease and cancer.¹⁰⁹

Swedish researchers looked at the association between fish consumption and prostate cancer in a prospective cohort of 6,272 men. Over a 30-year

Fish may offer special benefits for certain people — benefits that could be lost as growing numbers become frightened away from enjoying fish.

period, prostate cancer was two to three times higher among men who ate no fish compared to those who ate fish regularly. "Results suggest that fish consumption could be associated with decreased risk of prostate cancer," they concluded.¹¹⁰ European researchers found an inverse relationship between certain cancers of the digestive tract (oral cavity, pharynx, stomach, esophagus, colon, pancreas and rectum) and fish consumption, although no relationship with other cancers.¹¹¹

Despite the recognized nutritious attributes of fish, those trying to frighten people about mercury frequently suggest fish oil supplements as safe and effective substitutes. But research has not yet identified the specific nutrients or combinations in fish which may actually be responsible for its benefits. Nor have studies identified the underlying mechanisms or the needed amounts of those beneficial nutrients, according to the American Heart Association.¹¹² Fish oil supplements are not magic bullets and themselves carry risk. They can exacerbate bleeding disorders especially for those taking anticoagulant medications. And research, such as that by Kevin L. Fritsche, Ph.D., at the University of Missouri, Columbia, caution fish oil supplements appear to impair the immune system and could be risky for those with weakened immune systems such as the elderly.^{113,114}

"A food-based approach to increasing omega-3 fatty acid intake is preferable," said Dr. Kris-Etherton. The data most supports the recommendation made by the AHA Dietary Guidelines to include at least two servings of fish per week (particularly fatty fish), she said.¹¹⁵

Losing the pleasures of the table

In the final analysis, according to the science, fish is a perfectly good, nourishing food and it appears there is more risk from not eating it than eating it. So before we swallow every new bit of alarmist fear hook, line and sinker, culinarian and renowned author Irena Chalmers says it's important to "separate scientifically provable cold, hard facts from raving red-hot rhetoric." Reminding us that fish has been a delicious part of our menus for ages, she humorously advises a healthier perspective on the entire matter:

"They" say red wine is good is for you and so is exercise. So if you want to live a long and happy life, it seems you should jog from bar to bar. When you get there ask for a glass of Merlot and some fish and chips or some salmon with Hollandaise sauce. A glass of cool, dry, fruity white wine probably won't kill you either.¹¹⁶

Being afraid of our food and believing that certain foods are harmful isn't good for us. It even makes eating that food less nutritious for us. Researchers have found that *enjoying* our meals, loving what we eat and having a relaxed attitude means we digest our food better and absorb significantly more of its nutrients.¹¹⁷ In today's pervasive climate of food phobias, we've not only abandoned science, we've worked ourselves into such a frenzy, we've lost all sense of balance and old-fashioned common sense. For increasing numbers of us, the greatest risk may be losing one of life's greatest pleasures.

Solutions born of fear cost us all

Fears drive us to make decisions emotionally, and those are rarely sound. When we're afraid, we want to feel safe at any cost and we're more vulnerable to supporting feel-good solutions. But allocating scarce resources to address hypothetical risks and pursue overly cautious solutions can take money away from things that could do much greater good, even while doing nothing at all to really address the very thing we fear.

The proposals to reduce our exposure to methylmercury center upon enacting new regulations on power plant emissions. While these regulations will be among the most expensive federal regulations ever promulgated in the history of the country, they disregard the scientific evidence and known facts about the various forms of mercury, where methylmercury comes from, and how it gets in our fish.¹¹⁸ The bottom line is that regardless of the regulations instituted, reducing U.S. mercury emissions won't appreciably reduce methylmercury levels in fish.

To determine the financial costs of bringing utility generators into compliance with emissions regulations, the U.S. Department of Energy commissioned the Clean Energy Futures study conducted by several national laboratories. It projected that mercury reduction costs between 2001 and 2020 would reach \$129 billion to \$162 billion, and that with emissions limits, by 2007 both average electric rates and natural gas prices would increase (32 percent and 17 percent, respectively).¹¹⁹

All expenditures, whether paid by government agencies or companies, are eventually paid by individuals. Ultimately, there is no one else to pay. —

Daniel E. Klein, MBA and Ralph L. Keeney, Ph.D.¹²⁰

Higher energy costs trickle down and affect every aspect of life and raise the cost of every item consumers need and want. Higher energy costs also cut into business profits, leading companies to increase their prices for products and services for consumers. Some companies may, in the short term, cut their profit margins, creating smaller returns for shareholders and hurt those relying on retirement savings, or cut payroll expenses by laying off employees or lowering salaries. As higher costs reverberate throughout the economy and slow economic growth, some companies will inevitably be forced to go out of business and that will significantly impact those who lose their jobs and pensions, and shareholders who lose their investments. Of course, with diminished tax revenues, public health, safety, educational and social services would also be adversely impacted.

Estimates are 2.2 to 4.5 million jobs will be lost, increasing unemployment rates by about 1.4 to 2.9 percentage points. These effects appear to be persistent, taking five to ten years or more before the economy adjusts to higher-cost alternatives.¹²¹ Job loss and company failures jeopardize pensions, leaving retirees job-hunting in their sixties and seventies, facing medical costs they no longer can afford, uprooting families to move to lower-cost communities, selling dream retirement homes and losing money counted on for caring for elderly parents. A downturn in business prosperity throws people in hardship situations, as many learned when United Airlines defaulted on its pension plan in June, 2005, leaving 120,000 pensioners and employees high and dry. More than twenty other companies have already defaulted on pension funds in the past three years, totaling more than \$100 million.¹²²

Higher energy bills means less disposable income. A review of the representative economic research found that fully replacing coal-fueled power in the U.S. could reduce household incomes substantially — by \$125 to \$225 billion in 2010.¹²³ Less money typically results in poorer nutrition and less money available for preventative healthcare.

There are many studies relating increased unemployment with higher levels of illness, death, crime and violence.

“Babies will have less prenatal health care, adults may forgo physical exams and preventative medical expenses (e.g. pap smears) and postpone safety purchases (e.g. home fire alarms), and individuals will not attend smoking clinics to stop smoking or spend as much to reduce stress (hire babysitters or pursue recreation),” concluded a review of mortality and energy costs by Daniel Klein, of Twenty-First Strategies LLC, an economic and energy consulting firm, and Ralph Keeney, Ph.D., a risk analysis expert at Duke

University.¹²⁴ And there are many studies relating increased unemployment with higher levels of illness, death, crime and violence, Klein and Keeney reported.

Advocating feel-good solutions supposedly to protect people from mercury, without regard to the suffering and deaths they will impose is disingenuous. Looking at the lives lost due to regulatory costs, Klein and Keeney noted that regulations could result in 14,000 to 25,000 additional deaths per year. Childhood mortality has been estimated at greater than 100,000 lives.¹²⁵

And the human toll resulting directly and indirectly from higher energy prices and resulting lower incomes and higher unemployment rates will fall disproportionately onto the elderly, minorities, the poor and blue-collar working class. Energy costs take a bigger bite out of the budgets of low-income people than of higher-income households, so higher energy costs are regressive. Fifty percent of the burden will fall on households earning less than \$25,000 and 0.9 percent among those making \$75,000 or more.¹²⁶

A number of studies have looked at the suffering that will befall society's already most disadvantaged as a result of these mercury regulatory solutions. The National Mining Association reported the real-life impact of high utility costs on the millions of low-income households already in danger of having their power shut off: putting them at risk for homelessness, malnutrition, heat stroke, children removed from homes due to substandard living conditions, senior citizens forced to sell their homes, and children whose education is disrupted by changing residences.¹²⁷

Low-income U.S. families, many with disabled or elderly family members, already face difficulties paying their energy bills and can ill afford the estimated increases that would occur. The Economic Opportunity Research Institute of Washington, D.C. conducted a study for the DOE and found about 30 percent (27.9 million) of U.S. households already need federal energy assistance. Another seven million households had energy costs disproportionately higher than their income, as much as 30.5 percent of their income for an additional two million household.¹²⁸

Taxpayers would be hit with additional tax increases to expand tax-funded energy assistance programs as utility prices skyrocket. In 2004, nearly \$1.9 billion was appropriated to help low-income families cover their energy bills through the Low-Income Home Energy Assistance Program and other emergency funds. The LIHEAP program has requested \$3.4

billion for 2005, with \$300 million for emergency assistance.¹²⁹ More taxes come back around to reduce disposable income for even more Americans, further slowing our country's economic growth and reducing the health, well-being and quality of lives for increasingly more of our citizens.

Americans deserve to know and balance all aspects of the mercury fears. Only then will those perpetuating the fears be held accountable.

The truth is, when fears and politics overtake sound risk analysis based on evidence, reason, and compassion — the costs for all of us are simply too great. — Sandy Szwarc, RN, BSN, CCP¹³⁰

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The views and opinions expressed in this paper are those of the author, and not necessarily those of the Center for Science and Public Policy.