

# Harvard School of Public Health

## Press Releases

### 2006 Releases

## New Study Shows the Benefits of Eating Fish Greatly Outweigh the Risks

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Boston, MA – Many studies have shown the nutritional benefits of eating fish (finfish or shellfish). Fish is high in protein and omega-3 fatty acids. But concerns have been raised in recent years about chemicals found in fish from environmental pollution, including mercury, PCBs and dioxins. That has led to confusion among the public—do the risks of eating fish outweigh the benefits?



Researchers from the Harvard School of Public Health (HSPH) tackled that question by undertaking the single most comprehensive analysis to date of fish and health. In the first review to combine the evidence for major health effects of omega-3 fatty acids, major health risks of mercury, and major health risks of PCBs and dioxins in both adults and infants/young children, the results show that the benefits of eating a modest amount of fish per week—about 3 ounces of farmed salmon or 6 ounces of mackerel—reduced the risk of death from coronary heart disease (CHD) by 36%. Notably, by combining results of randomized clinical trials, the investigators also demonstrated that intake of fish or fish oil reduces total mortality—deaths from any causes—by 17%.

Included with [the paper \( http://jama.ama-assn.org/cgi/content/abstract/296/15/1885 \)](http://jama.ama-assn.org/cgi/content/abstract/296/15/1885), which appears in the October 18, 2006, issue of *The Journal of the American Medical Association*, is the first comprehensive summary of levels of omega-3 fatty acids, mercury, PCBs and dioxins in various species of fish and other foods, including chicken, beef, pork, butter and eggs.

“Overall, for major health outcomes among adults, the benefits of eating fish greatly outweigh the risks,” said [Dariush Mozaffarian \( http://www.hsph.harvard.edu/researchers/dmozaffa.html \)](http://www.hsph.harvard.edu/researchers/dmozaffa.html), lead author of the study and an instructor in epidemiology at HSPH and in medicine at Brigham and Women’s Hospital. “Somehow this evidence has been lost on the public.”

More than two decades ago, pioneering studies showed that Greenland Eskimos, who consumed high amounts of omega-3 fatty acids from seafood, had very low rates of CHD death. Further studies found that omega-3 fatty acids in fish appeared to have important neurodevelopmental benefits to children during gestation and infancy. Conversely, concerns have also been raised about potential harmful effects to human health from chemicals in fish.

The researchers, Mozaffarian and [Eric Rimm \( http://www.hsph.harvard.edu/faculty/EricRimm.html \)](http://www.hsph.harvard.edu/faculty/EricRimm.html), associate professor of epidemiology and nutrition at HSPH, did a comprehensive search of publications through April 2006 to evaluate the evidence from studies that looked at the relationship between fish intake and major health benefits as well as at the health risks of mercury, dioxins and PCBs. For benefits, the researchers focused on cardiovascular health in adults and brain development in infants, areas in which the scientific evidence is strongest

(other potential benefits of fish consumption--for example, for cognitive decline or depression--might make the overall benefits even greater). The researchers focused on evidence from large prospective studies and randomized clinical trials.

The evidence across different studies showed that fish consumption lowers the risk of death from heart disease by 36%. The benefit was related to the level of intake of omega-3 fatty acids, and thus benefits are greater for oily fish (e.g. salmon, bluefish), which are higher in beneficial omega-3 fatty acids, than lean fish (haddock, cod).

"We also found that fish or fish oil intake reduces total mortality by 17%, a remarkable reduction considering that this is the benefit for deaths from all causes," said Mozaffarian.

For infants and young children, the authors found that omega-3 fatty acids from seafood likely improve early brain development; children could obtain that benefit from pregnant or nursing mothers who consumed fish.

Mercury levels in fish are one potential risk of eating seafood. Studies have shown that high levels of mercury exposure, for example, following an industrial accident, can have adverse health effects. However, the effects of low-level exposure (i.e. from eating fish) are less well-established. The researchers found no definite evidence that low-level mercury exposure from seafood consumption had harmful effects on health in adults, although they did find that mercury may lessen the cardiovascular benefit--but not cause net harm--from eating some fish.

The evidence was suggestive that mercury may have subtle effects on brain development for a child exposed in the womb, or in early childhood. To obtain the benefits of omega-3 fatty acids for brain development and minimize the potential risk of mercury, the investigators' findings agreed with the recommendations of the Environmental Protection Agency and Food and Drug Administration that women of childbearing age, nursing mothers and young children should eat up to two servings per week of a variety of fish (for example, salmon, light tuna, shrimp, mackerel, and up to 6 oz. per week of albacore tuna) and avoid only four species of fish—golden bass (also known as tilefish), king mackerel, shark and swordfish—larger, predatory fish that have higher levels of mercury. The researchers emphasized that this advisory is only for women of childbearing age, nursing mothers and young children, not the general population. Importantly, the evidence suggests that, for those women, it is as important for their health and for the brain development of their infants that they eat a variety of other types of fish as it is to avoid the four fish species higher in mercury.

Some studies have shown that PCBs and dioxins may be carcinogenic. The authors found that the benefits of eating fish far outweighed the potential cancer risks from these chemicals. "The levels of PCBs and dioxins in fish species are low, similar to other commonly consumed foods such as beef, chicken, pork, eggs, and butter. Importantly, the possible health risks of these low levels of PCBs and dioxins in fish are only a small fraction of the much better established health benefits of the omega-3 fatty acids," said Mozaffarian. "For example, for farmed salmon, the cardiovascular benefits are greater than the cancer risks by a factor of at least 300:1. With the exception of some locally caught sport fish from contaminated inland waters, the levels of PCBs and dioxins in fish should not influence decisions about fish intake."

The study also points out that only 9% of the PCBs and dioxins in the U.S. food supply come from fish and other seafood; more than 90% comes from other foods such as meats, vegetables, and dairy products.

There is great public confusion over the risks of eating seafood. "Unfortunately, the media and

others may have contributed to this confusion by greatly exaggerating the unsubstantiated claim of a health risk from fish. These results from over two decades of research clearly show there is a health risk if adults don't eat fish," said Rimm.

The authors conclude that, based on the evidence, the benefits of eating one to two servings of fish a week greatly outweigh the risks among adults and, except for a few species of fish, women of child-bearing age. "It is striking how much greater both the amount of the evidence and the size of the health effect are for health benefits, compared with health risks. Seafood is likely the single most important food one can consume for good health," said Mozaffarian.

The research was supported by the National Institutes of Health.

[\("Fish Intake, Contaminants, and Human Health \( <http://jama.ama-assn.org/cgi/content/abstract/296/15/1885> \)](http://jama.ama-assn.org/cgi/content/abstract/296/15/1885) : Evaluating the Risks and the Benefits," *JAMA*, October 18, 2006—Vol. 296, No. 15)

For more information, contact:

Todd Datz

617-432-3952

[tdatz@hsph.harvard.edu](mailto:tdatz@hsph.harvard.edu)

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**Harvard School of Public Health, 677 Huntington Avenue, Boston, MA  
02115**

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