

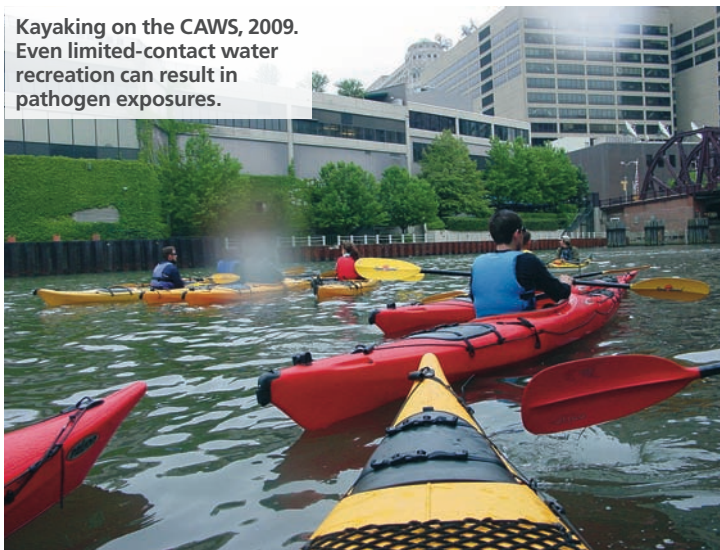
## In the Same Boat?

### Health Risks of Water Recreation Are Not Limited to Full-Contact Activities

Forty years after the Clean Water Act established a goal that the nation's waters be suitable for recreation, many waterways still fail to meet that standard. Those deemed unsuitable for full-contact recreation are nevertheless used for limited-contact water activities such as boating, kayaking, and fishing. Although several states have started exploring site-specific standards for limited-contact recreation in waterways with high bacterial concentrations, very little is known about whether these activities are safe in such settings. The Chicago Health, Environmental Exposure, and Recreation Study, a prospective cohort study of more than 11,000 users of waterways in and around Chicago, sought to estimate the health risks associated with limited-contact recreation in potentially contaminated waters [*EHP* 120(2):192–197; Dorevitch et al.].

The study compared health outcomes between people who engaged in limited-contact water recreation in the Chicago Area Waterways System (CAWS), those who engaged in limited-contact recreation in “general-use” waters that had been deemed suitable for full-contact recreation, and a reference group of people who engaged in outdoor recreation near but not in contact with water. The CAWS consists primarily of wastewater, including 300 million gallons received daily from each of two wastewater plants. This effluent is treated with an activated sludge process but is not chemically disinfected. Earlier studies showed levels of *Escherichia coli* and *Enterococcus* bacteria

**Kayaking on the CAWS, 2009.**  
Even limited-contact water recreation can result in pathogen exposures.



were much higher and *Cryptosporidium* and adenovirus type F were detected more frequently in the CAWS than in samples from the general-use waters.

Study participants were interviewed prior to their recreation activity, with followup interviews by phone 2, 5, and 21 days afterward. CAWS users experienced more eye symptoms than those in the reference or general-use water groups, and people who engaged in water recreation activities at all were significantly more likely than the reference group to develop gastrointestinal illness in the first 3 days following recreation.

The researchers found no difference in the frequency at which gastrointestinal illness developed between general-use and CAWS users. They speculate that the two groups may have received comparable average doses of ingested pathogens, with CAWS users exposed to waters with higher pathogen densities but general-use users more likely to immerse their heads and faces in the water. There was a higher risk of eye symptoms in CAWS users than in the reference or general-use groups, but no statistical differences existed between the 3 groups for development of respiratory illness, rash, or ear problems.

Strengths of the study include its large size and prospective exposure self-assessment, while limitations include the reliance on self-reported health outcomes and the inability to quantify actual exposures to pathogens during recreational activities. The results suggest that, contrary to general assumptions, there are health risks associated with limited-contact recreation in waterways—even in water bodies designated as safe for swimming and other full-contact activities.

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## Heart Disease Tradeoffs

### The Built Environment, Air Pollution, and Activity

In many areas urban planners have begun to incorporate physical activity considerations into neighborhood design. But simply designing cities that encourage people to be more physically active may not go far enough to protect the population from heart disease, according to a study that compares the relative risks of inactivity and air pollution exposure within a large metropolitan population [*EHP* 120(2):247–253; Hankey et al.]. The new work is one of a small but growing number of studies to compare the health impacts of exercise and air pollution.

The researchers capitalized on geocoded self-report travel diaries from a state-funded 2001 survey of more than 30,000 Los Angeles residents to execute the new study. They estimated the survey respondents' relative risk of ischemic heart disease based on cohort studies of activity level and exposure to air pollution, and used modeled and measured concentrations of fine particulate matter ( $PM_{2.5}$ ), ozone, and nitrogen oxides ( $NO_x$ ) to quantify individual exposures. They relied on geographic information system data to assess participants' neighborhoods for land-use attributes demonstrated to encourage active modes of transportation: higher population density, higher intersection density (i.e., streets that are interlinked at multiple points), and a more diverse mix of land uses.

People living in neighborhoods rated as having high walkability had rates of physical activity that were 50% higher than residents of low-walkability neighborhoods.

The results indicated ischemic heart disease deaths were more strongly linked with inactivity than with air pollution. However, risk differences between high- and low-walkability neighborhoods were generally comparable for air pollution and for physical inactivity, in part because high- and low-walkability neighborhoods both experienced a relatively small proportion of participants who were classified as physically active. Neighborhood patterns differed among the pollutants, with more deaths attributed to ozone exposure in low- versus high-walkability neighborhoods, and more deaths attributed to  $PM_{2.5}$  and  $NO_x$  exposures in high- versus low-walkability neighborhoods.

Strengths of the study include its use of real people's rates of physical activity; many previous efforts to address the same issues have been based on hypothetical examples. Weaknesses include its cross-sectional nature and the self-report (rather than objective measurement) of physical activity. The authors conclude that efforts to design healthy neighborhoods should account for both air pollution and physical inactivity, rather than addressing each one in isolation.

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