Fifty years ago, although hearing loss was considered a normal part of aging and frequently went untreated, a surgeon named Samuel Rosen, MD, conducted ecological studies comparing the hearing of people living in different countries and speculated that lifestyle and behavioral factors associated with cardiovascular disease might cause hearing loss in the elderly.2-5 Unfortunately, hearing scientists overlooked this seminal work and little progress was made in identifying ways to prevent or delay age-related hearing loss.

Since 1993, as part of the Epidemiology of Hearing Loss Study (EHLS), 3753 people in Beaver Dam, Wis., have been providing information essential to change this perception and to bring attention to the unmet need for hearing health care.6-8 From 2005 to 2008, 3285 of their adult children (mean age 49 years) participated in the Beaver Dam Offspring Study (BOSS) to understand how the risk of hearing loss has changed for recent generations and to identify environmental and genetic factors important in age-related sensory disorders.9

The EHLS is a population-based cohort study built on the existing Beaver Dam Eye (BDE) Study. The BDE study was developed by Ronald Klein, MD, MPH, and Barbara Klein, MD, MPH, with strong support from local health care professionals and civic leaders, to study the major eye diseases of aging.10 Rather than relying on volunteers or clinic groups, they conducted a census to identify every Beaver Dam resident age 43 to 84 years old, and invited them to have free eye examinations from 1988 to 1990. From 1993 to 1995, the residents were also invited to participate in the EHLS.6 Every 5 years, the cohort has been retested, and the study has grown to include measures of olfaction, cognition, and atherosclerosis.7 The 16-year follow-up examinations began in March 2009 to investigate the long-term effects of higher levels of inflammatory markers and early subclinical vascular disease on the development of hearing, olfactory, and cognitive impairments.

Studying residents of a community reduces the potential for biased results as everyone, regardless of health, medical problems, education, or occupation, is asked to participate. Longitudinal studies provide key information about risks associated with factors measured before sensory impairments are detected. This study has demonstrated that hearing loss is 1 of the most common chronic conditions. Few older adults had undergone a hearing test in the preceding 10 years, and cardiovascular disease and its risk factors, as well as noisy hobbies, may be associated with the development of hearing loss.6-8,11-13 The prevalence of hearing impairment was 46%, the 5-year incidence was 21%, and hearing worsened during the 5-year follow-up period for 53% of those with hearing impairments at the baseline examination; only 15% of people with hearing impairments used hearing aids.6-8

The Beaver Dam community’s partnership with researchers has been essential for the study’s success. Beaver Dam’s efforts have inspired other scientists to establish similar studies of minority groups in the United States and study populations as far away as Australia. With data from parents and children, we are evaluating if the risk of sensory disorders has changed over the course of the 20th century as exposures to environmental factors, lifestyle factors, and medications have changed dramatically.

During the next 5 years, new findings from the EHLS and the BOSS will help to elucidate the mechanisms driving sensory changes in aging; identify ways to intervene (lifestyle modifications and medical treatments) to reduce the risk of impairments in hearing, olfaction, and cognitive function with aging; and define the magnitude of the unmet need for health care necessary to maintain quality of life and independence for tomorrow’s elders. The detailed and extensive questionnaire, plus laboratory and examination...
data provided by the more than 7000 participants form a unique resource to discover ways to preserve good health in aging.

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**References**

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