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Estimation of excess mortality associated with influenza epidemics specific for sex, age and cause of death in Japan during 1987–2005

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Objectives: The aim of this study is to clarify the excess mortality associated with influenza epidemics in Japan during the period from 1987 to 2005.

Methods: Monthly data on the total number of deaths (excluding accidental deaths) and the numbers of deaths due to malignant neoplasms, heart disease, cerebrovascular disease, pneumonia, and renal failure were obtained from vital statistics from 1987 to 2005. The point estimates and range of excess mortality were evaluated using a model based on annual mortality and seasonal indices. Total mortality was analyzed for all ages, sex and for the following five age groups: 0–4, 5–24, 25–44, 45–64, and ≥ 65 years.

Results: The excess number of deaths showed almost no difference in each influenza season between men and women. During each influenza season, approximately 85–90% of the excess mortality was attributed to the ≥ 65 years age group. During the 1995 and 1999 seasons, mortality increased significantly across all age groups. The highest point estimate of excess mortality in the ≥ 65 years age group was observed in 1999. From a comparison of the range of excess mortality in the ≥ 65 years age group by year, the excess mortality in 1995 appeared to be the highest of the examined years. The highest point estimate of excess mortality in the 0–4 years age group was observed in 1995. From a comparison of the range of excess mortality in the 0–4 years age group by year, the excess mortality in 1998 or 1999 appeared to be the highest of the examined years. Excess mortality in the 45–64 years and ≥ 65 years age groups showed an increasing tendency in the 1990s and a stabilizing tendency beginning in 2000. In addition, excess mortality during each epidemic was occurred in persons with pneumonia, heart disease, cerebrovascular disease, malignant neoplasms, and renal failure, accounting for approximately 20–50, 20–40, 20, 5, and 2% of all the excess mortality, respectively.

Conclusions: These results indicate that the majority of excess mortality occurred among the elderly and persons with pneumonia, heart disease, or cerebrovascular disease. Although it is unclear whether the increasing trend in the 1990s and the stabilizing trend beginning in 2000 were the result of vaccination measures, health measures for groups such as the elderly and heart disease patients are considered to be important for the future.

Investigation of air pollution in a shopping center and employees' personal exposure level

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Objectives: To investigate the concentrations of chemicals found inside a shopping center (SC), we investigated the condition of air pollution in a SC and the personal exposure level of SC employees.

Methods: The survey was performed in June 2006 in Kyushu. The chemicals studied were volatile organic compounds (VOCs) and aldehydes. The chemicals were collected by a personal passive sampler.

Result: Thirty-one VOCs and aldehydes were detected inside the SC. The results showed that the concentrations of all the chemicals detected in indoor air were less than those specified in the indoor air quality guideline of Ministry of Health, Labor and Welfare, Japan. The chemical concentrations in the SC decreased in the order of food corner > electric, clothing corner > outdoor and were clearly higher than those outdoors. Therefore, it is thought that the source of chemicals is indoors. The high indoor concentration of 2-ethyl-1-hexanol

may be due to diffusion from the walls and floors. In addition, it is suggested that the personal exposure condition of the employees reflected the indoor concentration of each sales floor. The exposure level to formaldehyde was higher at nonworking time than at working time, suggesting that a larger exposure source exists in the place of residence than in the work place.

Conclusions: We found that indoor air quality in SC is maintained at good levels. This might be because of the Japanese strict regulations that require administrations of large-scale buildings to provide adequate ventilation and perform regular measurement of indoor air quality.

Reliability of health insurance claim statistical data based on the principal diagnosis method

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Objective: The estimation of disease-specific medical expenses in Japan is based on the assumption that all medical care expenses in a given claim are spent on the principal diagnosis even though health insurance claims actually include multiple diagnoses. The purpose of this study was therefore to evaluate the validity of this methodology.

Methods: Medical expenses and the diagnosis based on the International Classification Of Diseases, which are presently used for the Japanese National Health Insurance program, were obtained from 8,471 outpatient medical expense claims from the National Health Insurance for Medical services for the aged in Okaya city, Nagano Prefecture in May 2004. We calculated the frequency of each specific disease and estimated the disease-specific medical expenses using only the principal diagnosis in a claim and ten diagnoses (principal diagnosis and nine additional diagnoses). Disease-specific medical expenses using ten diagnoses were estimated according to the proportional disease magnitude method.

Results: The proportion that the principal diagnosis method reflected the frequency based on the method using ten diagnoses differed

depending on the diagnosis. The proportion for hypertension was 59.7%, whereas it was 33.3% for diabetes mellitus. Hypertension and diabetes mellitus were estimated to be 18.32 and 5.38%, respectively, of all medical care expenses, as determined using the principal diagnosis method. However, when using ten diagnoses, hypertension and diabetes mellitus were estimated to be 8.50 and 5.16%, respectively, of all medical care expenses.

Conclusions: The above described principal diagnosis method is therefore considered to overestimate the medical care expenses of diseases that are often selected as the principal diagnosis.

Health effects of nanoparticles and nanomaterials (I): recent overview of health effects of nanoparticles

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Recently, the impact of nanoparticles and nanomaterials on health and environmental effects has become a big issue. There are two types of nanoparticles to be considered in hygiene science; environmental nanoparticles emitted from automobiles and manufactured nanoparticles such as fullerenes, carbon nanotubes, and ultrafine metals/metal oxides. These very fine particles are potentially health threatening, because they are supposed to be highly permeable in the lung and skin tissues and small enough to evade phagocytosis by reticuloendothelial system. The dose metrics are critical to evaluate toxicity of nanoparticles, because the surface-based rather than weight-based concentration has been reported to correlate well with effects and endpoints of nanoparticles. Research on environmental nanoparticles should be done as a part of research for fine particles or particulate materials less than 2.5 μm (PM_{2.5}). Variety of materials, such as carbon, metals, and metal oxides, are included in manufactured nanoparticles. Moreover, some of nanomaterials are generated in the shape of fiber and sheet. Thus, we should focus more on non-specific biological interactions and tissue permeability to investigate health effects of manufactured nanoparticles. In this report trend in health effects of nanoparticles is overviewed.