

Earth Sciences Summer Student Program:

Impact of Temperature Anomaly on the Cardiovascular Disease Related Mortality Rate of Elderly in Taipei: From Health Warning System to Potential Climate Change Impact Assessment

Supervisors:

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Project description:

There is evidence that prolonged periods of extreme temperature anomalies may have significant impact on mortality, especially associated with cardiovascular disease and for elderly. The high mortality associated with the European heatwave of August 2003 has led to an increased focus on this subject. The estimate of temperature threshold for excessive mortality from the expected seasonal variation is usually done by analyzing the time series data. Such anomalous temperature threshold and its mortality level are known to vary in different locations due to local climate, adaptation to the thermal stress, and socio-economic environment. We would first examine whether there is a threshold temperature above (below) which mortality increases rapidly as temperature increases (decrease) in Taipei metropolitan area. Taipei is located in subtropical climate zone that is typically hot and humid in summer and mild in winter with occasional cold surge that can bring local temperature below 10°C. There is generally no heating system in winter. But abundant presence and use of air-conditioning in the home or residential institution in summer. This is in contrast to the temperate climate zone in mid-latitude where winter heating is generally available, but less so for the air-conditioning in summer. Therefore, we would also emphasize on the impact of cold surge on excessive mortality in Taipei. The Central Weather Bureau provided observed data on the daily mean, maximum and minimum temperature at Taipei station, from 1981 to 2006. Daily mortality and population data for elderly over 65-year-old were provided by the department of health for the same period. With the analyzed temperature threshold and forecast information on the likelihood of temperature anomaly distribution, there is a possibility to develop a health warning system for prompt and appropriate action to prevent heat(cold)-related illnesses and deaths. We also plan to use future climate change projection from the IPCC global climate models to make assessment on the potential climate change impact on the mortality rate associated with cardiovascular disease and for elderly in the future.

Preferred background of student candidates:

- Senior or Junior students interested in data analysis are both welcome.
- Strong knowledge/experience in computers (linux system) would be helpful.
- Good programming skills (in Fortran) or familiar with statistical analysis package would be advantageous.
- No background knowledge in meteorology or environmental health is necessary.