continuously emitted, annual health checkups focusing on the respiratory system were performed from February 2006. Since 2008 health checkups, a fractional exhaled nitric oxide concentration (FeNO) was measured. The present study aims to investigate the relationship between SO2 exposure and FeNO by comparing FeNO of the Miyakejima students with FeNO of reference students in another island in Japan, where SO2 concentration is far lower than the Japanese Environmental Standards.

Methods All subjects aged 13–14 years. Total number of Miyakejima and reference students were 83 and 31. From SO2 concentration measured at the fixed-point monitoring stations, we calculated the average SO2 concentration (ppb) during the 3 month periods prior to the health checkups. Based on the clinical practice guidelines of the Official American Thoracic Society, 35 ppb was used as a cutoff point of FeNO.

Results The average SO2 concentrations from 2008 to 2014 were 17.6, 17.5, 9.6, 7.3, 8.4, 4.2, and 5.0, respectively. The prevalence (%) of Miyakejima students with abnormal FeNO at 2008 to 2014 health checkups 50.0, 27.3, 18.2, 57.1, 46.2, 32.38.5, and 50.0, respectively. These prevalence were not statistically higher than the prevalence of the reference students (41.9%).

Discussion No clear dose-response relationship was observed in this study. In addition to this study, we also examined the medical records of patients at the Chu-Clinic between 2005 and 2010. Totally 4586 medical records were examined. Of these, 2594 patients developed a disease potentially caused by SO2 concentration. Therefore, further studies with regards to the relationship between the incidence of disease and SO2 should be conducted.