EXPOSURE TO VOLATILE ORGANIC COMPOUNDS AND HEALTH RISKS AMONG RESIDENTS IN AN AREA AFFECTED BY A PETROCHEMICAL COMPLEX IN RAYONG, THAILAND

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Abstract. In Thailand, there is a growing concern regarding the possible effects of air pollution on the health of residents living near a petrochemical complex in Map Ta Phut Industrial Estate (MTPIE), Rayong Province, Thailand. We studied exposure to selected volatile organic compounds (VOCs) in Map Ta Phut and the association between residing near the petrochemical complex and respiratory ailments. We carried out a population-based cross-sectional study, utilizing health data regarding respiratory problems among adults collected as part of a Health Effects of Air Pollution study of residents living in Map Ta Phut Municipality, Thailand, using a standardized questionnaire. The distance from the subject’s residence to the center of the MTPIE was mapped using a geographical information system (GIS). A total of 15,441 adults aged ≥ 13 years who lived in Map Ta Phut Municipality for at least 1 year were included in the study. Multiple logistic regression models were used to examine the relationship between the distance between the subject’s residence and the MTPIE and the presence of the respiratory problems during the previous 12 months. A 5 km distance was chosen as the maximum study radius. Volatile organic compounds were observed higher concentrations at sites downwind from the MTPIE, and closer to the MTPIE. Study subjects who lived closer to the MTPIE reported an odor more frequently than subjects who lived farther from the MTPIE. Living closer to the MTPIE was associated with more acute respiratory problems, but not more chronic respiratory problems than living farther from the MTPIE. Adults aged ≥ 40 years were more likely to have respiratory symptoms and eye irritation than those aged < 40 years. Females were more likely to have dyspnea, wheezing and upper respiratory symptoms than males. Living near the MTPIE for more than 5 years was associated with an increased risk of wheezing and upper respiratory symptoms.

Keyword: VOCs, exposure, health effects, residential proximity, Map Ta Phut, Thailand

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