

# Assessment of The Impact of Toluene Exposure on Urinary Hippuric Acid Concentration of Batik Workers in Special Region of Yogyakarta, Indonesia

**Annisa Artsani Hanif ANKA<sup>1\*</sup>, Katharina OGINAWATI<sup>1</sup>, Sri Awalia FEBRIANA<sup>2</sup>,  
Ikeu TANZIHA<sup>3</sup>, Cita Rosita Sigit PRAKOESWA<sup>4</sup>**

<sup>1</sup> Department of Environmental Engineering, Faculty of Civil and Environmental Engineering,  
Bandung Institute of Technology, Indonesia

<sup>2</sup> Department of Dermatology and Venereology, Faculty of Medicine Public Health and Nursing,  
Gadjah Mada University, Indonesia

<sup>3</sup> Department of Community Nutrition, Faculty of Human Ecology, IPB University, Indonesia

<sup>4</sup> Department of Dermatology and Venereology, Faculty of Medicine, Airlangga University, Indonesia

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Toluene is one of the toxic organic compounds found in the batik working area that can cause both acute and chronic health effects with the central nervous system being the main organ target. Toluene released from the production area may expose workers and induces health problems. Insufficient design and quality of the ventilation system on home-scale industries, also minimum usage of personal protection equipment may exacerbate the level of exposure.

This research assesses the risk of toluene exposure by measuring inhaled toluene and urinary hippuric acid as its biomonitoring compound. Hazard index of toluene exposure and odds ratio of risk factors on toluene intoxication are calculated. Urinary hippuric acid concentrations were also measured and compared with the ACGIH standard. A cross-sectional study was conducted in three different batik industries with a total of 56 respondents located in the same area in the Special Region of Yogyakarta, Indonesia. The exposed group is production workers in batik industries while the control group is resident who is not working as a batik producer or being exposed to toluene. Interviews were done to gather information about attributes, working histories, and lifestyles that may be a risk factor of toluene intoxication. Inhaled toluene concentrations were collected using a personal sampler pump and measured using GCMS meanwhile urinary hippuric acid was measured using HPLC-UV.

Preliminary data analysis shows that more than 30% of respondents experiencing tiredness and difficulty to concentrate, and more than 40% experiencing headache, numbness in feet, and sleeping disorder which are symptoms of toluene intoxication. Current data analysis showed that workers who work using batik wax have a higher probability of increasing urinary hippuric acid levels (OR 13.33, p-value < 0.05). Further data analysis on inhaled toluene and its correlation with urinary hippuric acid concentration are expected to give an increasing health risk level on workers compared to the control group. Other than that, calculation of odds ratio of age, gender, working period, work division, type of working area, and smoking habits using logistic regression analysis may give information about additional risk factors and cofounding factors of the outcome.

\* Correspondence  
✉ artsanianka@students.itb.ac.id