

Penilaian Risiko Kesehatan Terhadap Paparan Bahan Kimia dan Biological Agent Pada Analis Laboratorium Lingkungan PT X Tahun 2025

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Abstrak

<div style="text-align: justify;">Paparan bahan kimia dan agen biologis di laboratorium lingkungan berpotensi menimbulkan risiko kesehatan yang signifikan bagi analis laboratorium. Penelitian ini bertujuan untuk mengevaluasi tingkat risiko kesehatan akibat pajanan bahan kimia melalui rute inhalasi dan dermal, serta paparan terhadap agen biologis (bakteri) yang digunakan di Laboratorium Lingkungan PT X pada tahun 2025. Penilaian risiko dilakukan menggunakan metode Chemical Health Risk Assessment (CHRA) dari DOSH Malaysia untuk bahan kimia, serta metode BIOGAVAL NEO untuk agen biologis. Hasil penelitian menunjukkan bahwa beberapa bahan kimia seperti benzena, formaldehida 37%, asam sulfat dan kalium dikromat memiliki nilai hazard rating dan exposure rating yang tinggi pada kedua rute pajanan tersebut. Sementara itu, paparan agen biologis seperti Escherichia coli dan Salmonella spp. diklasifikasikan ke dalam kelompok risiko 2 berdasarkan klasifikasi WHO. Evaluasi terhadap pengendalian risiko mengungkapkan bahwa meskipun beberapa tindakan telah diterapkan, seperti penggunaan fume hood, masih terdapat praktik kerja yang kurang aman dalam aktivitas yang melibatkan bahan kimia, serta kelemahan dalam penerapan prinsip biosafety dan biosecurity dalam penanganan agen biologis. Oleh karena itu, diperlukan peningkatan efektivitas pengendalian yang ada serta penerapan pengendalian tambahan yang lebih spesifik, terarah, dan menyeluruh guna memastikan perlindungan optimal bagi tenaga kerja laboratorium dari risiko kesehatan akibat paparan bahan kimia dan biologis.</div><hr /><div style="text-align: justify;">Exposure to chemical substances and biological agents in environmental laboratories has the potential to pose significant health risks to laboratory analysts. This study aims to evaluate the level of health risk resulting from chemical exposure via inhalation and dermal routes, as well as exposure to biological agents (bacteria) used in the Environmental Laboratory of PT X in 2025. Risk assessment was conducted using the Chemical Health Risk Assessment (CHRA) method from DOSH Malaysia for chemical agents, and the BIOGAVAL NEO method for biological agents. The results indicate that several chemicals, such as benzene, 37% formaldehyde, sulfuric acid, and potassium dichromate, have high hazard rating and exposure rating through both inhalation and dermal exposure routes. Meanwhile, exposure to biological agents such as Escherichia coli and Salmonella spp. is classified as Risk Group 2 based on WHO classification. Risk control evaluation revealed that although some measures have been implemented—such as the use of fume hoods—unsafe work practices still persist in activities involving chemical handling. Additionally, weaknesses remain in the implementation of biosafety and biosecurity principles in activities involving biological agents. Therefore, it is necessary to enhance the effectiveness of existing controls and implement additional, more specific, targeted, and comprehensive control measures to ensure optimal protection for laboratory personnel from health risks due to chemical and biological exposures.</div>