

ORAL

A .Willingness To Pay Survey For Improved Water Supply System In Rural Area

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Abstract

Everyone has the right to access to the potable water because it is one of the basic needs of human being. In Malaysia, in the year of 2014, 96.04% of rural households have access to clean water supply where 13.5% of them are using alternative water supply systems. The sources of water supply which were free from pollution at beginning of project, now suffering from deterioration of water quality in general. Under certain circumstances, sources of the water systems, become contaminated and no longer considered potable or drinkable due to various changes in natural or human actions. The government is giving emphasis on clean water supply, whether in urban or rural areas. Under Ministry of Health (MOH), actions have been taken to improve the standard living in rural communities as well as safe water quality. MOH under Rural Water Supply and Sanitation (BAKAS) Programme is taking part to implement the roles accordingly by making upgrades to systems supplied to the rural communities, however the up-grading projects are often unable to be sustained because of incompatibility of the systems and acceptance by the rural community especially for indigenous people. The Gravity Feed System (GFS) is one of water supply schemes under BAKAS's program that contribute the most extensive coverage of safe water supply for rural area that used alternative system. This study employs a contingent valuation method to estimate Willingness To Pay (WTP) in order to learn more about household preferences for improved water supplies and their willingness and ability to contribute toward the participation in term of ownership, health concern, labour and costs of operation and maintenance of the GFS water supply system. Health Concern is the most important factor influencing the WTP to indigenous communities. By applying awareness of health and hygiene practices it can help in the success of the plan to upgrade GFS water supply systems.

Keywords

Potable water; water supply; rural area; willingness to pay

MERCURY CONTAMINATION INCIDENT: AN INVESTIGATION

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Introduction: Improper disposal of hazardous chemical could potentially harm the public. Mercury was discovered by a teenager at an abandoned facility in a palm oil plantation in Penang in May 2016. Oblivious to the toxicity of mercury, the unique physical properties of mercury fascinated him to collect, share and play with it resulting in 83 exposed individuals out of which 50 were warded.

Objective: To determine mercury vapor concentrations at several affected localities as part of a hazardous waste and emergency response to mercury contamination.

Methodology: Elemental mercury concentrations in air was measured using Nippon Instruments Corporation (NIC) EMP-1A Mercury Gas Monitor which recorded instantaneous data through a data logger. Measurements of mercury vapor were conducted at five dwellings and one high school after HAZMAT team had performed decontamination procedures.

Results: A total of fifteen sampling points were selected in this investigation. Highest mercury vapor mercury concentration was 0.051 mg/m^3 at one of the sampling points; which exceeded the suggested recommended level for mercury exposure by Agency for Toxic Substances and Registry (ATSDR) of less than 0.001 mg/m^3 for residential area. Improved ventilation by opening doors and windows was found to be effective in reducing ambient mercury concentrations up to 73%.

Conclusion: Lack of knowledge and the enjoyment of abuse of freely available mercury in the environment has led to several health problems and even hospitalization among ignorant victims. The use of mercury vapor analyzer facilitated in ensuring that the decontamination procedure was effective.

Keywords: mercury exposure, airborne mercury, public awareness, hospitalized victims

WHEN THE SICK CARERS BECOME SICK: THE PREVALENCE AND RISK FACTORS OF SICK BUILDING SYNDROME (SBS) CAUSED BY POOR INDOOR AIR QUALITY (IAQ) AMONG HEALTHCARE WORKERS IN SABAH, 2016.

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Introduction

As government facilities in Sabah built as early as 1972, IAQ becomes an issue. One of the health effects of poor indoor air quality (IAQ) is SBS. The aim of this study is to identify the prevalence of SBS that reflects poor IAQ and the factors contribute to the prevalent of SBS symptom among healthcare workers.

Methodology

A cross-sectional study was carried out in various government health facilities in Sabah. 119 healthcare workers in Sabah have responded to the self-administered questionnaire, which was based on ICOP IAQ, 2010. The data was analysed using SPSS Ver. 22.0 for Chi-square and multiple logistic regression.

Results

A total of 28.6% of the respondents are male, and 71.4% are female. The majority age group responded are 25 to 39 years (55%). Most of the respondents are non-smokers (86.3%). 63.9% of them were having a central unit air-conditioned area, while 36.1% have a split unit of air-conditioner. The highest SBS prevalence is headache (79.83%), followed by heavy-headed (70.6%), and nausea or vomiting (32.8%). The relationship between headache and other factors were assessed. Based on multivariate analysis, it was found that sex (male gender), age (group of less than 25 years old, 25-39 years old and 40-55 years old), working hours, number of people sharing the workstation and previous history of asthmatic problem are the significant contributor to the SBS symptoms.

Conclusion and recommendation

Being a healthcare worker, being healthy is crucial to care for the sick and prevent sickness. Thus, adhering to the acceptable range of IAQ parameters (Temperature, humidity, air movements, biological and chemical contaminants) in government health facilities will eliminate the SBS in HCWs.

Keywords : Indoor Air Quality, Sick Building Syndrome, Healthcare workers, government healthcare facility

Investigation of Indoor Fungi in an Office Building

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Introduction :

Poor building maintenance and excessive humidity from condensation on walls, plumbing leaks or roof leaks may lead to indoor fungi growth. This may pose as a health problem as they may be one of the causes of "sick building syndrome". The aim of the investigation was to determine the total count of airborne fungi and to identify the type of fungi in an office building with fungal infestation.

Case study :

There were evidence of leaking from the roof through visual observations and interviews conducted with the staff. Air samples for fungal count were collected using Single Stage Viable Cascade Impactor (SKC BioStage®). Sixteen samples were taken, consisting of twelve air samples from six different areas and four ceiling scrapings. From the findings, the airborne fungal count ranged between 72 to 1459 cfu/m³ (Median=169cfu/m³, N=12). There were nine fungal genera identified, with *Aspergillus spp.* (67%, N=12) predominating the air samples while *Aspergillus spp.* and *Stochybotrys spp.* (75%, N=4) predominating the ceiling scrapings. *Stochybotrys spp.* produces mycotoxin that is toxic to health, which correlates with the staff's symptoms of cough and exacerbation of asthma in the areas where *Stochybotrys spp.* was found.

Conclusion :

The results showed there was one area in the building in which the total fungal count was significantly above the upper permissible limit of 1000 cfu/m³, as suggested by Industry Code Of Practice On Indoor Air Quality 2010 Malaysia (ICOP-IAQ, 2010). *Stochybotrys spp.* was found only from the ceiling scrapings and not from air sampled as its spores are not readily disseminated in the air.

Suggestion :

Investigation on the types of fungi and mycotoxins released into the environment should be further studied as it has harmful effects on the health of the affected indoor occupants.

Keywords :

mould, *Stochybotrys spp.*, mycotoxin, dampness, sick building syndrome

HEALTH IMPACT ASSESSMENT IN ADVANCING DEVELOPMENT:

A PARTNERSHIP EFFORT BETWEEN STAKEHOLDERS

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Health impact assessment (HIA) is one of the management tools in ensuring the health of existing and the future generations. It has been adopted in most of the planning of mega projects, but not by small, medium industries that known to be the major polluter. Hereby, it's important that each stakeholder has to play their roles effectively and do it together with others as equity collaboration in prevention and control of the pollution. There are 12 environmental health areas that required surveillance and monitoring, which include issues of communicable diseases, non-communicable diseases, veterinary, sanitation, nutrition, accidents, social determinants, cultural practices, health facilities and capacity. There should be a smart partnership between authority agencies and non-government organisations together with the community. In view of changing in the economy, expansion and complexity of the Mcommunity, the environment should be able to sustain its important functions as the place of choice for where to live, a stronger and more resilient, a safer and healthier place to live, and opportunities to protect any properties. Each agency and NGOs have important roles in each 12 environmental health areas that are been identified as crucial and important in promoting and ensuring smart growth in the physical and economic health of the nation.

PREVALENCE AND RISK FACTORS OF RESPIRATORY SYMPTOM AMONG CHILDREN AT CHILD CARE CENTERS (CCCs) IN MALAYSIA

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ABSTRACT

ABSTRACT: In Malaysia, attention to indoor air quality started when Department of Safety and Health introduce Industrial Code of Practices (COP) in 2005; revised in 2010 with additional physical parameters, biological parameter and carbon dioxide as a ventilation performance indicator to govern the 'non-industrial place of work'. In 500 IAQ investigations over the last decade, inadequate ventilation (52%) is the primary sources of indoor air quality problem. The aim of this paper is to report the finding of indoor air quality study at child care centres (CCCs) with difference ventilation strategies and building characteristic. Modified ALS-DLD-78 has been used to gather information from parent regarding their children respiratory symptom. Measurements are performed for air temperature, relative humidity, carbon dioxide, carbon monoxide, respirable particle (PM_{2.5}), bacteria and fungi while information on CCC characteristics and potential surrounding air pollutants are collected via a combination of area monitoring, inspection and interviews. From the 491 responses, 259 (52.7%) children experienced cough and/or cold and productive cough 144(29.3%). The risk of prevalence cough and/or cold is significantly higher if they attend ACMV CCCs compared to NV CCCs and AC CCCs. ACMV CCCs and floor area (<3.5m²) were also associated with higher adjusted prevalence ratio cough and/cold an cough with phlegm.

Keywords: child care center, children health, ventilation system, respiratory

symptom

TIME SERIES ANALYSIS OF PARTICULATE MATTER OF LESS THAN 10 MICRONS (PM₁₀) IN CHERAS, KUALA LUMPUR

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ABSTRACT

Introduction: Particulate Matter of less than 10 micrometer in size (PM₁₀) is one of the major pollutants used to calculate Air Pollution Index (API). It is monitored as the predominant parameter and the API value was reported primarily on either PM₁₀ or ozone (O₃). This study aim to analyze and model this pollutant in order to forecast the short-term period which from 1st January to 9th February 2015.

Methods: Daily concentrations of PM₁₀ data recorded by Department of Environment, Malaysia from 1st January 2010 to 31st December 2014 was used in this study. Cheras was chosen as the study location since the monitoring station recorded the highest number of unhealthy days compared to other places in Kuala Lumpur. Time series analysis was used to analyze the trend of PM₁₀ and Auto Regressive Moving Average (ARMA) model was fitted to the data in order to predict the future concentration of PM₁₀. The performance of forecast point was measured using the batting average.

Results: ARMA(1,3) was the best model to fit PM₁₀ in Cheras during the study period. The first 40 days concentration in 2015 were predicted and fell within the 95% interval range using ARMA(1,3) which has 100% forecast ability.

Conclusion: Time series analysis is a method to identify the trend of the dataset over time. Simple ARMA model has the prediction ability that can be accurate only for a short time period. Other factors such as traffic volume and corresponding emissions that may influence the trend of this pollutant can be added into the model for more accurate forecasting in the future.

Keyword: PM₁₀; Air pollution; ARMA; short-term forecast

POSTER

Investigation of Indoor Fungi in an Office Building

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Keywords :

mould, *Stochybotrys spp.*, mycotoxin, dampness, sick building syndrome

Solid Waste Profile and the Composition in Sub-Urban Area

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ABSTRACT Solid waste management gives a major impact to human health, economy and environmental. In Malaysia, sewage management problem getting worse, there is a lot of illegal waste generated by irresponsible. In sub-urban area, solid waste management is under individual responsibility. Since of the area is not under the responsibility of local authorities, following which no fee is charged for solid waste management and assessment. The aim of the study is to identify the solid waste profile in addition of the composition in sub-urban area. It may lead to generate a crucial conclusion and identify the flow option in the study area.

Keyword: solid waste management, composition, flow option, sub-urban, Jempol, Malaysia

“AIR DI KERIAN KERUH..”

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ABSTRAK

Keperluan air melibatkan pelbagai kegunaan harian seperti kegunaan domestic dan industri. Isu kualiti dan keselamatan mutu air minum di sesuatu daerah tidak boleh di kompromi bagi memastikan kelestarian masyarakat. Air dikatakan keruh apabila ia mengandungi begitu banyak partikel bahan yang tersuspensi sehingga memberikan warna/rupa yang berlumpur dan kotor. Satu aduan diterima melalui aplikasi “Whatsapp” tentang kualiti air mentah berada yang di tahap “kurang memuaskan” pada 25 Jun 2016. Siasatan dari Unit KMAM PKD Kerian, telah dijalankan dengan serta merta dan mendapati bacaan nilai pH air mentah ialah 3.23 pH dan kekeruhan ialah 0.49 NTU. Selain itu, bacaan nilai aluminium ialah 0.80. Bacaan bagi air yang terawat pula ialah pH 3.78, 1.24 NTU (kekeruhan), dan 0.80 (aluminium). Proses rawatan didapati tidak berkesan dan kegiatan mengepam telah dihentikan serta-merta. Arahan peningkatan aliran air kolam telah dilaksanakan. Bagi mempercepatkan pergerakan air, pintu di terusan juga telah dibuka. Melalui proses ini, keadaan telah Berjaya dipulihkan dan rawatan ke atas aluminium dapat dijalankan dalam tempoh 6 jam. Daripada pemerhatian yang dijalankan, keadaan ini berlaku apabila aktiviti mengepam air masuk ke dalam terusan adalah dalam perkadaran tidak seimbang dan menghasilkan air yang tidak sesuai untuk menjalani proses rawatan diuji. Bagi mengatasi masalah ini di masa hadapan, solusi terbaik adalah menghasilkan satu system atau kaedah yang boleh diadaptasikan bagi mengimbangi air yang dipam masuk daripada saluran utama.

Key words: kekeruhan, aluminium,

UNIVERSAL PROSPERITY TOWARDS SUSTAINABLE DEVELOPMENT: COLLABORATION AND SYNERGY AMONG HELIX

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Abstract

Sustainable development is not possible without a healthy population. Health is one of the most important key to decreasing poverty. This is due to healthy individuals are more productive and can compete in equal basis with other individuals. Development of smart environment in sectors like air quality, water, sanitation and waste management are able to generate healthier co-benefits and lessen the risk of health. This paper aims to strengthen the networking platform to serve working group (WG) of NEHAP and adapt their cooperation framework towards achieving sustainable development goals (SDG). The platform will be covered on the scope of air quality, water sanitation and hygiene, solid and hazardous waste and ozone depletion. Upon the sharing session, it is expected to have a solid networking between the participants can be formed and joint activities will be established towards achieving SDG. Strong collaboration and fully commitments from all levels of agencies and organizations will expand the understanding of global-local linkages in order to create a win-win situation for sustainable urban development and the global environment. *Keywords: Sustainable development, health, networking platform, collaboration.*

Pejabat Kesihatan : Pejabat Kesihatan Bahagian, Bahagian Limbang

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Kategori : *Climate Change, Ozone Depletion And Ecosystem Change*

Tajuk

Perkaitan Di Antara Kejadian Kes Kolera Di Daerah Limbang, Sarawak Dengan Cuaca Pada Bulan Mac Sehingga Jun 2016.

Abstrak

Latarbelakang: Satu wabak kolera telah berlaku di Daerah Limbang pada bulan Mac sehingga Jun 2016. Terdapat 56 kes kolera dilaporkan yang melibatkan 22 lokaliti di Daerah Limbang. Lokaliti yang melibatkan kawasan menerima sistem bekalan air sama ada bekalan air terawat atau bekalan air tidak terawat, sistem sanitasi untuk tandas sama ada sanitasi atau tidak. Pada masa yang sama, kawasan utara negeri Sarawak terutamanya Bahagian Limbang dan negeri Sabah mengalami cuaca panas dengan fenomena El Nino.

Metodologi: Bilangan kes kolera terdedah kepada makanan dan air yang tercemar dan dianalisa terhadap cuaca iaitu suhu, taburan hujan dan kelembapan.

Keputusan: Keputusan yang diperolehi menggunakan analisa multivariate dan ia digunakan untuk tujuan *prediction model* bagi menjangka kehadiran *Vibrio cholera* semasa fenomena El Nino. Pecahan kes mengikut jantina; 26 orang lelaki dan 30 orang perempuan. Manakala pecahan kes mengikut umur; umur dalam lingkungan 30 – 39 tahun mencatatkan 20%. Manakala pecahan kes yang menggunakan sistem sanitasi yang sanitasi; 25% tidak sanitasi dan 75% sanitasi. Manakala pecahan kes yang menggunakan sistem bekalan air; 43% menggunakan air terawat dan 57% menggunakan air tidak terawat.

Kesimpulan: Bilangan kes kolera yang dilaporkan adalah berkaitan dengan fenomena El Nino iaitu peningkatan suhu dan kurang hujan pada awal tahun 2016.