

MOH/S/IMR/96.23(PR)-e



MINISTRY OF HEALTH MALAYSIA
NATIONAL INSTITUTES OF HEALTH

Compendium of **ABSTRACTS**

of the
24TH NIH SCIENTIFIC CONFERENCE
"Health Research to The People"

22ND - 23RD AUGUST 2023
NATIONAL INSTITUTES OF HEALTH (NIH)
SETIA ALAM, SELANGOR, MALAYSIA

<https://www.nih.gov.my>



COMPENDIUM OF ABSTRACTS

22 – 23 August 2023

Institute for Medical Research
National Institutes of Health (NIH), Setia Alam, Selangor, Malaysia

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All full papers and abstracts submitted to the 24th NIH-Scientific Conference 2023 are subject to a peer reviewing process, using subject matter experts selected because of their expert knowledge in the specific areas.

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FOREWORD

The Compendium of Abstracts of the 24th NIH Scientific Conference brings more pioneering research contents that addresses a variety of significant health and research topics in biomedical sciences, clinical, public health, and health system management in Malaysia. It is derived from a compilation of plenary talks, symposium sessions, poster and oral presentations during the 24th NIH Scientific Conference 2023, held at the National Institutes of Health in Setia Alam, Selangor from 22-23rd August 2023. The conference was jointly organized by the Institute for Medical Research (IMR) and the Ministry of Health Malaysia's Researchers Association (PENYELIDIK) with the aim to provide an interdisciplinary platform among the expert practitioners, researchers, and academic scientists to discuss and exchange scientific information, experiences, research results, and to address a wide range of issues within the three important clusters of biomedical sciences, clinical and public health, health system and management, as well as other related health disciplines.

All the abstracts of presentations during the conference are included in this compendium, which would allow us to consolidate and disseminate these research findings to a broader audience of researchers, academics, and healthcare professionals. There are 235 abstracts, covering a wide range of topics related to the three mentioned clusters. I thank all contributing presenters who have given their consent for IMR to publish. We believe that a special compendium dedicated to the abstract of presentations would greatly benefit the scientific and academic community by enhancing the impact and visibility of the research presented at the conference. Disseminating the findings to researchers who are constantly striving to improve the quality of their studies remains an important function of this scientific community. I am confident that its contents would constitute as an invaluable reference for both local and international health research professionals.

DR MARIANA AHAMAD

Chair,
SCIENTIFIC COMMITTEE MEMBERS
24TH NIH SCIENTIFIC CONFERENCE 2023

ACKNOWLEDGEMENT

We would like to thank the Director-General of Health, Malaysia for his permission to publish this Compendium of Abstracts of the 24th NIH Scientific Conference with the theme "Health Research to The People". Special thanks are dedicated to the oral and poster presenters of the conference. Their valuable research findings have contributed to the success of the conference.

We also wish to thank all members of the Scientific Committee specifically the Reviewers for their hard work in providing suggestions and recommendations for improvements of the abstracts; and the publication secretariat for making the publication of this compendium a success.



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PLENARY AND SYMPOSIUM – ABSTRACTS

PLENARY 1

The advancement of treatment & medical setting for patient with rare disease

Ngu Lock Hock

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In Malaysia, a disease or condition is defined as rare if it affects fewer than 1 in 4,000 people within the general population. Currently about 500 diseases are being listed in the Malaysia Rare Disease List. Most rare diseases are severe, chronic and life-threatening. Patients frequently wait years for a proper diagnosis. Only a limited number of rare diseases have at least one approved treatment. However, the scientific landscape for rare diseases has been changing rapidly, and this change is expected to accelerate. Science and technology advancement including advanced bio/genetic engineering, next-generation sequencing (NGS) and artificial intelligence provide unprecedented opportunities to accelerate rare disease diagnosis and treatment development. Clinical adoption of NGS-based tests such as gene panel, whole exome sequencing and whole genome sequencing have revolutionized the diagnostic approach for rare disease since more than 80% of rare diseases are of genetic origin. In recent years an array of innovative treatments across several modalities—recombinant protein, small molecule, gene therapies and even devices have also emerged for rare diseases. We now live in a time of unprecedented opportunities to turn scientific discoveries into better treatments. Improving coordination and collaboration in diagnostic, therapeutic and research initiatives among all the relevant stakeholders are critical to ensure that our country be part of these exciting medical and scientific developments so that our patients would not be left behind.

PLENARY 2

Public health policy decision in Malaysia – does evidence really matters?

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Health policy decision has far reaching impact and consequences on the improvement and well-being of the population. Resource is finite and competing priorities are many. Therefore, policy decision must be guided by best available evidence. Evidence-informed decision making (EIDM) is fundamental in ensuring effective, efficient, equitable and sustainable health policy decision and implementation. Public health leaders have moral and ethical obligation to ensure policy decisions are evidence-based. EIDM should be transparent and guided by the sense of accountability for the decision. But in reality, politics has significant influence on decision making, both at local and global level. Former Health Minister Subramaniam aptly summarised by stating during the Harvard Senior Leadership Program that “The health policy as a final product is triggered by the rigors of science, tempered by the powers of politics, balanced by the forces of economy and finally moulded by the values of the society”. I will discuss the topic based on my personal experience in the development and implementation of public health policies at international, regional WHO and national level while in office and from my observation as an outsider after my retirement.



SYMPOSIUM 1

BIOMEDICAL RESEARCH: CONNECTING THE DOTS FOR HEALTH

CHAIRPERSON: DR RAVINDRAN THAYAN SUKUMARAN
Head of Infectious Diseases Research Centre
Institute for Medical Research (IMR)

S.1.01 Current status on local vaccine development

Masita Arip^{1*}, Fatin Zahidah Binti Abdul Aziz², Bibi Faridha Mohd Salleh², Mohd Hazwan Md Ghazali², Sabrina Kamin², Rozainanee Mohd Zain³, Ching Yee Ming¹, Siti Nur Zawani Rosli³, Mohd Azlan Zaharudin²

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The COVID-19 pandemic has been one of the key contributing factors for the government to start considering the possibility of developing and manufacturing human vaccines in Malaysia. On 1st November 2021, the Malaysian's Prime Minister Dato' Seri Ismail Sabri Yaacob had officiated the launch of Malaysian Genome and Vaccine Institute (MGVI) and National Vaccine Development Roadmap (NVDR). The NVDR envisions the country to achieve self-sufficiency in vaccine manufacturing and R&D within 10 years to safeguard the national biosecurity, while developing a self-sustaining vaccine ecosystem, which will contribute to Malaysia's economy. The six strategies in NVDR are 1) Governance; 2) Manufacturing Infrastructure; 3) Clinical Trial; 4) Human Capital Development; 5) Vaccine Technology Acquisition and Development; 6) Vaccine Communication. The short-term plan (1-3 years) is developing the foundations and obtaining quick wins for vaccine production. The medium-term plan (3-6 years) is increasing human capabilities and ecosystem strength. The long-term plan (6-10 years) is driving research and development for growth and optimizing supply of vaccine in Malaysia.

S.1.02 Updates on the development of point of care testing for rapid diagnosis

Kavithambigai Ellan, Nur Izwani Saiful Bahrin, Shiela Koh Siau Yee, Rozainanee Mohd Zain

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Point of care testing (POCT) can be the mainstay of many tests for infectious diseases. The rapid diagnosis at the patient's bedside or outside the laboratory is seen as a way forward in improving the patient care at the health care facilities. POCT has demonstrated many advantages including rapid availability of results, no requirement for sample transportation and ease of use. Most POCT devices utilize principles of immunoassay and lateral flow chromatography. Rapid evolution from polymerase chain reaction (PCR) test to POCT as confirmatory tests was seen during the COVID-19 pandemic. For the POCT to be marketed in Malaysia, specific requirements from the Medical Device Authority (MDA) need to be fulfilled. The Virology Unit at the Institute for Medical Research is one of the laboratories involved in the tests/ kit evaluations. Since 2020 until June 2023, the Virology Unit had evaluated a total of 518 kits with the majority of kits evaluated was COVID-19 antigen tests. With the higher needs and the growing importance of POCT testing, Virology Unit has taken the initiative to develop our own POCT. Various steps are required in the development processes including training, purchasing of equipment and reagent and preparation of the suitable laboratory. Thus, the current status of the POCT development will be further illustrated.

S.1.03 Anti-SARS-CoV-2 and anti-inflammatory activities of *Marantodes pumilum* aqueous ethanolic standardized extract

Mohd Ridzuan Mohd Abd Razak, Nur Hana Md Jelas, Nor Azrina Norahmad, Norazlan Mohmad Misnan, Amirrudin Muhammad, Noorsofiana Padlan, Muhammad Nor Farhan Sa'at, Murizal Zainol, Ami Fazlin Syed Mohamed

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Several anti-COVID-19 medicinal plant based-candidates have been highlighted, such as “fah talai jone” or *Andrographis paniculata* extract from Thailand and Lianhuaqingwen capsule from China. Therefore, we aim to investigate the anti-COVID-19 potential of standardized *Marantodes pumilum* (*Kacip Fatimah*) extract, which is a Malaysian medicinal plant product via in vitro anti-SARS-CoV-2 and anti-inflammatory assays. Anti-SARS-CoV-2 activity of the *M. pumilum* standardized extract was tested against the wild-type Wuhan and Omicron SARS-CoV-2 variants by using cytopathic effect reduction assay. The potential mechanism of anti-SARS-CoV-2 action was determined by performing the Spike S1-ACE2 inhibitor and 3CL protease inhibitor assays. Toll-like receptor (TLR2 and TLR4) blocker assays were performed to assess the potential specific anti-inflammatory activity of the extract. The *M. pumilum* standardized extract treatment decreases the infection of Vero E6 cells by the wild-type Wuhan and Omicron SARS-CoV-2 variants with the EC50 value of <25 µg/mL. The extract prominently inhibited the SARS-CoV-2 3CL protease activity. The extract reduced the LPS induced-TLR4 receptor signaling response in a dose dependent manner. However, the extract showed no effect on the LPS induced-TLR2 response. In conclusion, in vitro studies showed *M. pumilum* standardized extract potential against SARS-CoV-2 infections and specific anti-inflammatory activity via TLR4 receptor response. Further evaluation of the extract in a COVID-19 in vivo model is warranted.

SYMPOSIUM 2

ECONOMICS, HEALTH AND PEOPLE

CHAIRPERSON: DR MOHD SHAHRI BAHARI
Institute for Health Systems Research (IHSR)

S.2.01 Turning health and economics on its head

Nor Zam Azihan Mohd Hassan

Center of Health Economics Research, Institute for Health Systems Research, National Institutes of Health (NIH), Ministry of Health Malaysia.

Economics is a discipline that addresses the fundamental issue of scarcity in the face of infinite human needs. It entails examining the allocation of scarce resources across various sectors, including the production, distribution, and consumption of goods and services. Similarly, economics seeks to unravel the complex problem of distributing a limited pizza among a large, hungry group of people. This notion when applied to healthcare, reflects the principle acknowledges the insufficiency of medical professionals, facilities, and medications to meet the comprehensive healthcare demands. Nevertheless, due to the inherent significance of good health for the people, governments must maximize the efficient utilization of resources to provide healthcare access to the greatest number of people. Enter health economics, a dedicated field to determining optimal healthcare decisions amidst limited resource availability. This discipline navigates considerations such as treatment efficacy and cost-effectiveness, akin to evaluating the most appetizing and affordable slices of pizza. Additionally, health economics examines the efficient allocation of financial resources, to maximize the population's healthcare benefits. By employing health economics principles and conducting comprehensive economic analyses, healthcare decision-makers can make informed choices. These decisions endeavor to ensure that available resources are used optimally to provide the greatest possible healthcare outcomes and serving to a larger population. Ultimately, the underlying objective is to foster equitable access to quality healthcare, promoting the well-being of all individuals within society.



S.2.02 The true and hidden cost of cancer: patients' perspective

Sivaraj Raman, Farhana Aminuddin, Nor Zam Azihan Mohd Hassan, Mohd Shahri Bahari, Nur Amalina Zaimi, Mohd Shaiful Jefri Mohd Nor Sham Kunusagaran, Marhaini Mostapha, Tan Yui Ping

Center for Health Economics Research, Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia.

Cancer forms a significant economic burden to the healthcare system and society as a whole. In Malaysia, there is still a gap in evidence in terms of the financial impact of a cancer diagnosis, especially on patients and their households. Such information is vital for understanding the challenges to access treatment and the development of financial protection policies. This discussion would be based on two separate cross-sectional studies consisting of an interviewer-guided survey among cancer patients in public hospitals. The first study was conducted among low-income cancer patients receiving government Household Living Aid in six facilities. This study was part of a larger exploration of the PeKa B40 financial incentives. The second study was focused specifically on oral cancer patients from different sociodemographic backgrounds. In the first study, a total of 430 cancer patients were interviewed. The mean annual total cost of various cancer diagnoses was RM12,935 (SD=13,094), consisting of an out-of-pocket (OOP) expenditure of RM7,254 (SD=9,760) and a productivity loss of RM5,681 (SD=8,375). On the other hand, the study among 104 oral cancer patients showed a similar pattern, with the total cost ranging from RM2,320 (SD=2,262) in precancer to RM10,133 (SD=9,960) in the late stages. The major OOP cost drivers in both studies were fees in public healthcare facilities followed by traveling costs and other expenditures. These studies reaffirm the substantial financial impact of cancer. While Malaysian public healthcare is highly subsidized, it may remain insufficient to protect this group from treatment-related expenses.

SYMPOSIUM 3

PEOPLE CENTRIC RESEARCH: IDENTIFYING THE GAPS AND ADDRESSING THE ISSUES IN COMMUNITY

CHAIRPERSON: DR MOHD SHAHRI BAHARI
Institute for Health Systems Research (IHSR)

S.3.01 Emergency Department congestion – health provider perspective

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Congestion in Emergency Department (ED) is one of the indicators of departmental and hospital patient flow inefficiency. Although it is a global issue, it must not be perceived or accepted as normal. International Federation for Emergency Medicine (IFEM) has launched a global campaign against ED overcrowding by stating that such situation is unacceptable. ED congestion or overcrowding posed significant threat to patient safety, hence need to be addressed urgently. Furthermore, overcrowding in ED denote a 'tip of iceberg' circumstances of the whole health care system. Study have shown that risk of death can be more than a third for patients who experience ED overcrowding during hospitalization. Adverse impact on health care providers such as burnout syndrome, patients and relative violence towards health care workers also has been well documented. One must realize that factors that contributing to ED congestions differs from one institution to another. Therefore, efforts made to overcome the issue mandate local pragmatic and practical solutions.

S.3.02 Using behavioural science to deliver better HEALTH

Trevor Webb

World Health Organisation Country Office for Malaysia, Brunei Darussalam and Singapore, Cyberjaya, Malaysia.

Health outcomes are dependent upon human behaviour. From attendance at a health clinic and maintenance of a treatment regime through to the adoption of healthier diets and exercise regimes, understanding the influences that impact behaviour is central to the design of effective and efficient policies, programs and interventions. Recently the World Health Assembly recognised the importance of the behavioural sciences when they adopted the 'Behavioural science for better health' resolution. The resolution urges Member States to acknowledge, use and build the capacity of staff in the behavioural sciences. The presentation will demonstrate how a theoretically based and empirically derived understanding of behaviour can assist in delivering better health outcomes. It will highlight how insights from the behavioural sciences have been used with health practitioners and patients across both clinical and community settings. As the burden of disease shifts increasingly toward non-communicable diseases, the behavioural sciences offer an additional lens through which to diagnose problems and design solutions.

SYMPOSIUM 4

THE TICKING BOMB OF NON-COMMUNICABLE DISEASE – HOW DOES IT AFFECT ME?

CHAIRPERSON: MS YVONNE LIM MEI FONG
Institute for Clinical Research (ICR)

S.4.01 More than just words to make more screen for cancer

Nicholas Yee Liang Hing

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Cancer screening plays a pivotal role in reducing the burden of cancer by enabling early detection and timely treatment, resulting in substantially higher chances of treatment success. However, low cancer screening rates in Malaysia have led to a rise in late-stage cancer detection and subsequently high mortality rates among diagnosed patients. Participating in cancer screening is a behaviour, which opens up opportunities for interventions rooted in behavioural science to encourage cancer screening uptake among Malaysians. Drawing upon the principles of behavioural science, there is promising potential in behavioural interventions that apply various nudge techniques to influence an individual's decision to screen. Some successfully studied techniques include simplifying the screening process, providing reminders and incentives, and leveraging social norms. By tailoring these techniques to Malaysia's unique cultural and societal context, policymakers have the key to unlocking a powerful tool to strengthen current national cancer control programmes. Moreover, recent advancements in digital health that incorporate behavioural interventions offer exciting opportunities. Emerging technologies such as mobile health applications and wearable devices provide innovative ways to deliver tailored nudges with enhanced effectiveness, which can potentially reach a wider population and drive sustained behaviour change. However, challenges such as scalability and long-term sustainability of such interventions remain. Addressing these challenges necessitates collaborative efforts between healthcare professionals, researchers, policymakers, and technologists. Hence, interdisciplinary collaboration, together with continued exploration and implementation of behavioral interventions, is imperative to significantly improve cancer screening rates and save more lives.



S.4.02 My blood sugar and tummy size: why do they matter to me and the future of Malaysia?

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Metabolic syndrome (MetS) is a group of conditions characterised by increased fasting glucose, waist circumference, blood pressure, triglycerides, and reduction in high-density lipoprotein cholesterol. Meanwhile, metabolic dysfunction-associated fatty liver disease (MAFLD) is the new term for fatty liver associated with MetS. People with MetS or MAFLD have higher risks for adverse cardiovascular outcomes and mortalities. However, large-scale data on MetS and MAFLD prevalence in Malaysia is mainly unknown. This study aims to determine the prevalence of MetS and MAFLD among the general adult population in Malaysia. This is a community-based nationwide cross-sectional study in Malaysia. The data collection period is from July 2023 until September 2023, involving an estimated 1,296 respondents. A two-stage proportionate stratified random sampling method is utilised to ensure national representativeness. The definition of MetS follows the Harmonised Joint Interim Statement in 2009. A diagnosis of MAFLD is made if a participant has fatty liver, defined as having fatty liver index ≥ 60 , and has type 2 diabetes or has BMI ≥ 23 kg/m² or has ≥ 2 metabolic risk abnormalities. Complex sample analyses will be conducted. Respondents with abnormal laboratory results will be referred to health facilities. The results will be disseminated through a formal report, policy brief, scientific publications, conference presentations, social media, print media, and stakeholder engagement activities. The information is crucial for raising awareness and knowledge of these important metabolic-related diseases among the general public. The findings will provide evidence and aid clinicians, programme managers, and policymakers in assessing, planning, and improving health services in Malaysia.

ORAL PRESENTATIONS: BIOMEDICAL SCIENCES

OP1.01 **Aedes surveillance in Selangor via ovitrap surveillance aided with the digital technology**

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Determine vector density is one of the key components in Malaysian National Strategic Plan for prevention and control of dengue fever. The use of ovitraps which is recognised as an effective method for Aedes surveillance even at low infestation levels has been widely used to determine the Aedes density and distribution. The density indexes serve as an indication for prioritising preventive action in hotspots with high population density. In this study, Aedes surveillance in twenty-seven pre-selected dengue endemic sites and three control sites were determined, aided with a mobile application to manage ovitraps setting in the field and during species identification in the laboratory. A total of 60 ovitraps were placed in each site for 5 days before being collected for laboratory identification of larvae to species level. PesTrapp permits immediate analysis of the Ovitrap Index (OI) and mean number of larvae (MNL) following the entry of the number of identified larvae by species. Majority surveillance sites had ovitraps indices above the 10% threshold, indicating a high population density. In terms of Aedes mosquito distribution, the Ae. Aegypti mosquito remains more common indoors, despite the fact that this species has been observed to breed outdoors. While the Ae. Albopictus mosquito is more common outdoors, it has also been found to breed indoors. In conclusion, dengue density was found to be high in both hotspots and control areas, with Ae. Aegypti still the dominant indoor breeder and Ae. Albopictus is the dominant outdoor breeder in all screened study sites. In addition, the integration of technology in ovitrapping activities circumvents the time-consuming limitations of manual data analysis by enabling rapid result visualisation population density.

OP1.02 **Anaphylaxis to soft shell baby crab (shellfish) vs histamine-like syndrome of scombrototoxin poisoning**

Noormalin Abdullah^{*}, Hemahwathy Chanthira Kumar

Allergy and Immunology Research Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health Malaysia.

Anaphylaxis or scombrototoxin poisoning, also called "histamine poisoning" presenting like anaphylaxis may occur after eating fish/shellfish that have been improperly refrigerated and stored at inappropriate temperature. We reported a case of 36 years old female presented to Emergency Department with acute onset of body rash 10 minutes after consuming fried frozen soft shell baby crab, followed by tongue and facial angioedema, shortness of breath, palpitation, and eventually hypotensive with a blood pressure of 70/40 mmHg. She was treated as acute anaphylaxis and was given intramuscular adrenaline, intravenous (IV) hydrocortisone, IV antihistamines and IV ranitidine. She was transferred to medical unit for further observation and discharged well. Lab investigations revealed normal serum tryptase of 1.99 µg/L, high total Immunoglobulin E (IgE) 320 ku/L, low specific IgE to crab, shrimp, clam, squid and undetected to oyster and lobster. Skin prick test (SPT) to all seafood were negative. A normal serum tryptase level does not rule out anaphylaxis as the symptoms could be attributed to anaphylactoid reaction (non-IgE-mediated anaphylaxis) to shellfish. A negative SPT to seafood does not rule out anaphylactoid reaction. Scombrototoxin is often a diagnosis of exclusion especially with history of rapid onset of systemic anaphylaxis after history of eating frozen packed shellfish. Scombrototoxin fish poisoning is caused by eating shellfish that have high levels of histamine, which is the result of not being properly refrigerated or preserved. Symptoms typically develop within a few minutes to an hour after eating. Anaphylaxis and scombrototoxin poisoning



are often clinically indistinguishable and therefore warrant further investigations.

OP1.03 Anti-malarial drug resistance study: utilisation of genome editing application for parasite survival throughout artemisinin drug challenge

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Artemisinin combination therapy (ACT) was recommended by the World Health Organization (WHO) as the first-line treatment for uncomplicated malaria infections. Currently, Malaysia depends on ACT for the treatment of all human malaria cases including zoonotic malaria, *Plasmodium knowlesi*. The mechanism behind artemisinin resistance (ART-R) is believed to be due to genetic alteration in the *Plasmodium* kelch 13 (k13) propeller gene that caused delayed parasite clearance, thus can progress to drug-resistance. The aims of this study are to initiate gene mutations using CRISPR-Cas9 technology for the generation of altered transfected parasite lines bearing the selected variants of the K13 mutant marker attributed to resistance and to verify the mutations using Ring Stage Survival Assay (RSA). Four Single Nucleotide Polymorphism (SNP) mutations were selected for genetic modification and were successfully inserted into the parasite genome respectively. The successfully transfected parasite lines were subjected to Ring Stage-survival Assay (RSA) by exposing the ring-stage parasites to 700 nM dihydroartemisinin (DHA). Results showed S600C, V494I and N537I transgenic parasite mutants revealed a significantly high percentage of parasite survival in RSA0-3h, with consistent results across both microscopic and flow cytometric approaches, therefore confirmed as a marker for ART-R. Meanwhile, mutation at L598G is sensitive to artemisinin treatment. Although many factors contributed to ACT treatment failure, this study supports the hypothesis that the mutation alters the binding site at the β -propeller region which may affect the efficacy of artemisinin to the parasite, which was also proven through a computational modelling approach.

OP1.05 Assessment of clastogenicity potential: *In vitro* micronucleus assay for *Hibiscus sabdariffa* aqueous extract, Si Roja

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Si Roja is a formulated standardized aqueous *Hibiscus sabdariffa* extract. The general toxicity studies of Si Roja did not show any toxicity effects in single-dose and repeated-dose (28 days) administration. However, the data of genotoxic effects has not yet been reported. Therefore, the objective of the study was to assess the clastogenic potential of Si Roja aqueous extract by determining the formation of small chromosomal fragments (micronuclei) in the cytoplasm of interphasing mammalian cells using *in vitro* micronucleus assay with Chinese hamster lung fibroblast, V79-4 cells. The cells were treated for 3 hours with Si Roja at three different concentrations (0.5, 1, and 2 mg/mL) with and without S9 mixture. The positive controls used were Mitomycin C at 0.3 μ g/mL (without metabolic activation) and Cyclophosphamide monohydrate at 12.5 μ g/mL (with metabolic activation). The V79-4 cells were harvested, fixed, and stained with acridine orange and scored under fluorescent microscope with emission rate of 450-490 nM. Then, the total number of micronucleus formation was calculated. No significant changes were detected in the number of micronucleated cells when compared to controls with the highest number of micronucleated cells was observed only in positive controls. In conclusion, Si Roja did not induce significant micronucleus formation in V79-4 cells and further investigation need to be conducted in animal models to confirm the safety of Si Roja.

OP1.07 Enhancing sputum sample quality and efficiency: evaluating the impact of MoSCo 2.0 in tuberculosis diagnosis and treatment

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Quality of sputum samples for acid fast bacilli (AFB) smear can affect the accuracy of the test results and subsequently impact clinical decisions regarding TB treatment. The Selangor Blinded Re-Checking External Quality Assessment (BR-EQA) reported an increase in result interpretation errors and a high percentage of poor-quality sputum samples. A randomized experimental study was conducted comparing two methods of sputum sample collection: the standard sputum container and MoSCo 2.0. A total of 132 samples were collected randomly, using either method, and the quality of the specimen, smear, AFB detection, and processing time were analysed. Patients with confirmed or suspected pulmonary tuberculosis (TB), were randomly selected from the treatment centre registry for inclusion in the study. The key results of the study indicate that sputum samples collected using MoSCo 2.0 showed a higher percentage (64%) of good-quality samples based on macroscopic evaluation. Microscopic evaluation revealed improvements in the quality of the smear prepared, including evenness (47%) and thickness (33%). Time taken to produce AFB slides was also 10 minutes faster and AFB detection rate increased by 2%. Study findings highlights that MoSCo 2.0 can improve productivity while maintaining the quality and standards required by WHO. In conclusion, the study demonstrates the benefits of MoSCo 2.0 over the standard sputum container, particularly in terms of improving sample quality, processing time and productivity. However, there is a need for future research with a larger sample size and further testing for reliability and sensitivity, to provide adequate evidence and address potential study limitations.

OP1.08 From green to red: exploring capsaicinoids and pungency levels in different maturity stages of *Capsicum frutescens* L.

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Capsaicinoids are the compounds responsible for the pungency of chilies and their concentrations play a crucial role in determining their heat levels. This study aimed to investigate the variation in capsaicinoids levels and pungency across different maturity stages of *Capsicum frutescens* L., commonly known as cili padi in Malay. Green, yellow, and red chilies were analysed for their capsaicin, dihydrocapsaicin, and nordihydrocapsaicin contents using high-performance liquid chromatography (HPLC). The pungency levels have been determined using Scoville Heat Units (SHU). Results showed a decline in capsaicinoid levels from green to red chilies. The total capsaicinoid content was highest in green chilies (4.49 mg/g), followed by yellow chilies (3.09 mg/g), and red chilies (2.69 mg/g). Similar trends were observed for individual capsaicinoids, with green chilies exhibiting the highest levels. As for pungency levels, measured by SHU, showed a similar pattern, with green chilies having the highest pungency (71234 SHU), followed by yellow chilies (49030 SHU) and red chilies (42576 SHU). This study provides valuable information into the capsaicinoid composition and pungency variations during the maturation process of *C. frutescens* L, which is crucial for optimizing the harvesting and culinary uses and applications of chili



in various industries, such as food and pharmaceuticals.

OP1.09 Identification of potential PAD4 inhibitors from Malaysian Natural Products Database by using computer aided drug design (CADD)

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Protein arginine deiminase type IV (PAD4) is a promising target for the treatment of several diseases, including rheumatoid arthritis and cancer. However, there are no drugs currently available that specifically target PAD4. Currently, PAD4 backdoor inhibitor, GSK199, has been synthetically produced and reported to specifically bind to PAD4 using noncovalent interactions. Due to the limited number of specific PAD4 inhibitors, there is an increased need to identify potential PAD4 inhibitors. The aim of this study is to screen the Malaysian natural product database to identify lead compounds of PAD4. This study uses CADD approaches, including molecular dynamics (MD) simulation, structure-based pharmacophore modelling (SBPM), molecular docking, and ADMET, to answer the objective. MD simulation shows that PAD4-GSK199 was stable throughout the simulation. The clustering analysis resulted in 17 PAD4 representative structures. Next, SBPM was used to identify the key features of PAD4-GSK199 binding and to screen the potential compounds from the natural product database. As a result, three compounds namely MSC2848, MSC3889, and MSC3957 were detected from the virtual screening. These compounds have the potential of making interactions with important residues in the PAD4 pocket, according to the docking results. However, they were predicted to be toxic and did not pass Lipinski's rule. In conclusion, three compounds containing glucopyranose and glucopyranose-like moieties were found to be capable of binding to the PAD4 pocket. Since they did not pass the ADMET predictions, these compounds should be structurally modified before being developed as PAD4 inhibitors.

OP1.10 Innovative non-animal human-based cell model of neurological disorders: iPSC application for Leigh's Syndrome research

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Induced pluripotent stem cells (iPSCs) provides unprecedented opportunities in the field of disease modelling. Differentiated neuronal cells derived from iPSCs have been suggested as a non-animal human-based alternative tool for exploring disease pathogenesis and toxicity testing for various neurological disorders. Leigh's Syndrome (LS) is a progressive neurodegenerative disorder linked to mitochondrial dysfunction with poorly understood disease pathogenesis. Here, we aimed to generate iPSC-derived neurons from a LS patient and develop an in-vitro disease model. Human dermal fibroblasts from a LS patient and healthy controls were isolated from skin biopsy and reprogrammed via lentiviral transduction of select transcription factors. The resulting iPSCs were characterized by immunocytochemistry and qRT-PCR for pluripotency and genetic stability. iPSCs were differentiated into NSCs and neurons by defined medium. iPSC-derived neurons were analysed by high content image analysis for analysis of mitochondrial membrane potential and neuronal morphology. Fibroblast reprogramming produced embryonic stem cell-like cell colonies. Generated iPSCs exhibited typical morphology and highly expressed pluripotent markers with no genetic aberrations. LS-iPSCs were able to differentiate into neural stem cells and neurons expressing mature neuronal markers. LS-neurons showed reduced mitochondrial membrane potential and ATP production compared to controls. LS-neurons exhibited less roots per cell compared to controls. We

successfully generated iPSC-derived neurons from an LS patient exhibiting mitochondrial dysfunction and altered neuron morphology. The iPSC-based LS neurodegenerative model validates the application of iPSC technology as a non-animal human-based approach for understanding disease pathology and can be used to develop new strategies for diagnosis and therapeutic screening.

OP1.11 Methodological strategy in enriching evidence-based information for *GlobinMed*

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The Global Information Hub on Integrated Medicine (*GlobinMed*) website was launched in 2007. As an internet-based platform, it disseminates evidence-based traditional and complementary medicine (T&CM) information to the public. It bridges the gap towards integrated medicine by connecting different facets of T&CM knowledge with up-to-date scientific information. The website has progressively gone through several stages of feature and interface upgrades to optimise its user-friendliness. The objective of *GlobinMed* is to systematically develop the content updates by using a structured and methodological review approach to enrich *GlobinMed*'s evidence-based information. Systematic search based on pre-determined keywords relating to scopes in *GlobinMed* was conducted followed by data evaluation, data extraction and content writing. Completed content will then undergo designing, editing, revising, verification and uploading to the website with output consisting of updated content to existing articles, new articles, and infographics. This intricate process ensures validated, up-to-date, evidence-based information delivery to *GlobinMed*'s users. The impact of this approach is illustrated by the increase of users within one year period (2022-2023), the top three countries indicating increase are India (470%), Philippines (327.3%) and Singapore (159.6%). The highest viewed pages are the Malaysian Herbal Monograph, showed 289.5% increase within the same duration, followed by Medicinal Herbs and Plants Database with 138.3% increase. This shows the importance of continuous updates of reliable and validated evidence-based articles catering to different target groups in the *GlobinMed* scopes. In conclusion, continuous content development warranted *GlobinMed* the well-deserved recognition and edge as a trusted platform for T&CM information.

OP1.12 Molecular identification and socio-demographic assessment of indoor microbial environments among building occupants in old buildings of Peninsular Malaysia

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Indoor microbial environments, primarily characterised by the proliferation of fungi, pose significant concern for occupants of old buildings due to the prevalent issues of deteriorating materials and physical conditions. Consequently, the presence of airborne biological agents and building dampness leads to a decline in indoor air quality and an increased risk of health problems among building occupants. To identify the composition of common indoor fungus found in old buildings, fungus cultivation followed by molecular identification was performed. Samples were collected from indoor air, building materials, and swabs taken from two selected old buildings with nine sampling sites in each building where fungal issues were identified. The cultivation technique involved the use of Sabouraud Dextrose Agar with Chloramphenicol and Gentamicin (SDACG) medium. Molecular identification and discovery were performed by extracting fungal isolates and comparison of DNA utilising the NCBI website and ISHAM barcoding database for high-similarity matches. Universal ITS primers (ITS1 and ITS4) were performed for DNA identification. A total of 333 different species were discovered, with the most prevalent genera being *Aspergillus sp.*, *Penicillium sp.*, *Cladosporium sp.*, *Fusarium sp.*, *Curvularia sp.*, *Pseudopezalotiopsis sp.*, *Trichoderma sp.*, and *Basidiomycota sp.* The Colony Forming Units (CFU/m³) measured in the old buildings were range from 116.43 to 5235.71. Health symptoms reported by building occupants included itchy scalp or ears,



headaches, heavy-headedness, fatigue, and skin problems. In conclusion, understanding the health effects from the exposure to indoor microbial environments can raise the occupants' awareness of the necessity for significant remediation measures in old buildings.

OP1.13 Neurodevelopmental effects of prenatal bisphenol a exposure on the expression of miRNAs encoded NMDA receptor subunit genes for learning and memory function in male Sprague Dawley rats

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Bisphenol A (BPA) is a synthetic compound commercially used to make plastic. Exposure to BPA during pregnancy has been shown to cause a placental transfer of BPA and next contribute to learning and memory impairment in offspring. Relatively, miR-19a and miR-539 were involved in acting as key regulatory of NMDA receptor subunit genes, GRIN2A and GRIN2B expression in the hippocampus. However, the action of BPA-induced miRNA alteration remains elusive. This study aimed to investigate the effect of prenatal BPA exposure on the level of estrogen receptor (Er), expression of miR-19a, miR-539, GRIN2A, and GRIN2B in the hippocampus as well as neurobehavioral outcomes. The mother was orally dosed with 5 mg/kg/day of BPA, while the control mother was without BPA exposure. The placenta was utilised in ELISA to observe the level of Er α and Er β and RT-PCR to measure the expression of miR-19a, miR-539, GRIN2A, and GRIN2B at different developmental ages. Further, neurobehavioral tests were assessed to evaluate memory retention ability. Prenatal BPA exposure was revealed to increase the Er α and Er β in the placenta and significantly downregulate miR-19a miR-539, GRIN2A, and GRIN2B ($p < 0.001$) in the hippocampus at all stages of age. This is accompanied by the impairment of fear and spatial memory during the adolescent age. In conclusion, the increment of Er α and Er β suggested inducing the rate of prenatal BPA exposure. This insight suggested to cause the downregulation of miRNAs and GRIN2 expression in the developing hippocampal and next led to learning and memory deficits when reaching adolescence.

OP1.14 Oxidative stress in patients with non-obstructive coronary artery disease

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Oxidative stress may be involved in the development and progression of non-obstructive coronary artery disease (NOCAD). Overproduction of reactive oxygen species may cause damage to cellular lipids, proteins and DNA. The aim of this study was to evaluate oxidative stress in patients with NOCAD and assess the relationship between coronary and peripheral circulation oxidative stress parameters in NOCAD. Serum oxidized LDL (OxLDL), malondialdehyde (MDA) and superoxide dismutase (SOD) were measured in 41 patients with NOCAD and 40 control subjects who have no history of angina. Coronary and peripheral bloods were taken during angiogram procedure in the NOCAD patients. Peripheral serum OxLDL levels was significantly higher in patients with NOCAD compared to controls (926.41 \pm 467.37 vs 672.81 \pm 402.15, $p = 0.011$). There was a non-significant trend

of increased peripheral MDA levels in NOCAD patients compared to controls ($p=0.063$). In the NOCAD group, the level of OxLDL in coronary was higher than peripheral circulation ($p<0.001$). Pearson's correlation showed positive correlation between peripheral and coronary circulation OxLDL levels and SOD activity ($r=0.642$, $p<0.001$ and $r=0.32$, $p<0.05$). Strong positive correlation between the peripheral and coronary circulation MDA levels were observed ($r=0.938$, $p<0.001$). NOCAD patients demonstrated higher OxLDL level compared to a control group. Positive correlations were seen in OxLDL, MDA and SOD levels between the peripheral and coronary circulation. This indicated augmented oxidative stress in patients with NOCAD, which may play a significant role in the development of NOCAD. The findings will hopefully guide clinicians and researchers on oxidative stress reduction management in the future.

OP1.15 Phase angle and diabetes in patients undergoing metabolic surgery: a baseline data from the prospective cohort (MoMen) study

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The use of phase angle (PhA) as a predictor of diabetic complications and disease severity is of growing interest due to its non-invasive nature and potential to reflect changes in body composition, cellular integrity, and improved cell function. To investigate the association between PhA, body mass index (BMI), visceral fat area (VFA) and HbA1c in obese patients undergoing metabolic surgery, to gain insights into the potential diagnostic and prognostic role of PhA in individuals with diabetes. A total of 82 patients, were recruited from multicentred hospitals in Klang Valley. Patients between 18 and 65 years old; men and women; BMI \geq 25 kg/m² (Asian BMI: WHO/IASO/IOTF, 2000); and scheduled for metabolic surgery were included in the study. Healthy individuals (BMI between 18.5-22.9 kg/m²) were recruited as controls (n=20). Patients were grouped into non-diabetes (n=36), prediabetes (n=25), and type 2 diabetes mellitus (T2DM) (n=21) according to HbA1c values. VFA and PhA were assessed using InBody S10. HbA1c was measured using high-performance liquid chromatography analyzer. No significant difference was found in PhA across the study groups (Kruskal–Wallis, $p=0.11$). Although insignificant, a weak negative correlation was observed between HbA1c and phase angle (Spearman $r=0.07$). There was no correlation between PhA and BMI or VFA ($p>0.05$). With our current data, PhA is not a good candidate for the diagnostic role in individuals with obesity and T2DM. PhA improvement in obese individuals with T2DM will continue to be monitored post-surgery for 6- and 12 months as it can be a marker of cellular integrity.

OP1.16 Phylogenetic analysis: a more promising method to differentiate *Candida haemulonii* complex and its closely related species

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Candida haemulonii complex (*C. haemulonii sensu stricto*, *C. haemulonii var vulnera* and *C. duobushaemulonii*), *C. auris*, and *C. vulturna* have a close genetic relationship. As an emerging multi-drug resistant yeast species,



these *Candida* species are isolated from various clinical specimens of immunocompromised and neonatal patients. Identification and differentiation of the various species within the *C. haemulonii* complex using omics methods can be troublesome. Here we describe a simple phylogenetic analysis method using the discriminatory power of the internal transcribed spacer (ITS) and large subunit (LSU) region to differentiate the *Candida* species within the *C. haemulonii* complex. The 32 yeast isolates were identified as *C. haemulonii* complex, *C. auris*, and *C. vulturna* by rRNA PCR-sequencing of the ITS and LSU region. The phylogenetic tree was then constructed using the DNA sequences of both regions. Six distinct clades (I to VI) and five distinct clades (I to V) of *C. haemulonii* complex and its closely related species were identified from both the ITS and LSU phylogenetic tree, respectively. *C. haemulonii* sensu stricto and *C. haemulonii* var. *vulnera* are separated into different clades in ITS phylogenetic tree but cluster within the same clade (Clade V) in LSU analyses. However, the analyses using ITS sequences was prominent in differentiating *C. haemulonii* sensu stricto and *C. haemulonii* var. *vulnera* compared to LSU. The outcome of this study was able to demonstrate the usefulness phylogenetic analysis using ITS and LSU sequences to differentiate the various species of *C. haemulonii* complex, *C. auris* and *C. vulturna*.

OP1.18 Preclinical safety and toxicity studies for registered COVID-19 vaccines in Malaysia: a methodological review

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Approval of vaccines for emergency use is one of the key efforts made by regulators during the COVID-19 pandemic. Therefore, many of these vaccines were expedited for clinical trials and registration. The National Pharmaceutical Regulatory Agency (NPRA) of Malaysia developed a directive for implementing fast-track conditional registration for new pharmaceutical products including vaccines. This review aimed to provide an overview of the characteristics of preclinical safety and toxicity studies that has been conducted for registered COVID-19 vaccines in Malaysia. COVID-19 vaccine registered in Malaysia were identified from the NPRA website. Published and grey literature were searched to collect data on types of preclinical safety and toxicity studies that has been conducted for these vaccines. There are six registered COVID-19 vaccines in Malaysia which consist of inactivated vaccine, messenger ribonucleic acid (mRNA) vaccine and viral vector vaccine. All vaccines had undergone preclinical safety and toxicity study components such as general toxicity (single and repeated dose toxicity study), animal developmental and reproductive toxicity (DART) and immunogenicity study using a range of rodent and non-rodent animals. Local tolerance and biodistribution studies were conducted by incorporating with repeated dose toxicity studies. Genotoxicity and carcinogenicity studies were not performed due to nature of vaccines not expected to have genotoxic potential. As for vaccine doses, a minimum of two up to four vaccine doses were tested in the study animals. Despite the urgency of vaccine use during COVID-19 pandemic, an array of preclinical safety and toxicity studies were performed vastly and rapidly to ensure its safety before human use. The characteristics of the preclinical safety and toxicity studies conducted across the different types of COVID-19 vaccines are similar.

OP1.20 Resistant pathogenic bacteria isolated from hospitals' effluent in Klang Valley, Malaysia: From the ward to wastewater

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The role of wastewater treatment plants (WWTPs) as hot spots for antimicrobial-resistant bacteria (ARB) and the dissemination of multi drug resistant (MDR) bacteria has been widely pointed out by the scientific community. In this study, we collected the wastewater from the hospital's sewage treatment plant in hospitals from Klang Valley, Malaysia. We aim to determine the prevalence of highly concerned resistant pathogens that related to nosocomial infections against multiples antibiotics and to quantify the level of antibiotics residues presence in the wastewater. The bacteria were isolated on selective culture media and confirmed using 16S RNA polymerase chain reaction (PCR). The positive colonies were subjected to antibiotic sensitivity testing (AST) against ceftriaxone (30 µg), ciprofloxacin (5 µg), meropenem (10 µg), vancomycin (30 µg), colistin (10 µg), and piperacillin/tazobactam (110 µg) using the disk diffusion method (Kirby Bauer) as per the Clinical Laboratory Standards Institute (CLSI) guidelines. An ultrahigh-performance liquid chromatography (UHPLC) system was used to quantify the levels of antibiotics from wastewater samples. From the analysed bacterial isolates (n=156), we identified *Enterococcus faecium* 9.6%, *Klebsiella pneumoniae* 17.3%, *Pseudomonas aeruginosa* 2.56% and *Enterobacter spp.* 7.1% with different antibiotic resistant profiles. We also found that 80% of identified *Enterococcus faecium* were MDR followed by *Pseudomonas aeruginosa* (25%), *Klebsiella pneumoniae* (19%) and *Enterobacter spp.* (18%) respectively. The highest mean concentration of antibiotic residues detected using UHPLC from the wastewater were vancomycin (0.735 µg/L) followed by ciprofloxacin (0.627 µg/L). It was concluded that waste generated from hospital and released into the environment contain MDR pathogens that may contribute to the antimicrobial resistance (AMR) global threats.

OP1.21 Risk assessment of methyl mercury from consumption of fish and seafood among population in Peninsular Malaysia

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Methyl mercury (meHg) is a widespread heavy metal and can cause various health effects. There are insufficient studies assessing its exposure risk among Malaysians. This study calculated risk associated to meHg from consumption of fish and seafood among population in Peninsular Malaysia (PM). Results were compared to the Provisional Tolerable Weekly Intakes (PTWIs) and Hazard Quotient (HQ). meHg levels of 67 species showed significant differences between samples ($p < 0.001$). Concentrations of meHg in fish and seafood groups in descending orders: demersal fish > pelagic fish > freshwater fish > cephalopods > crustaceans. Elderly consumed the highest amounts of fish (104.0 ± 113.0 g/day) compared to other age groups, while adolescents preferred cephalopod and crustacean ($p < 0.05$). Malay ethnic consumed significantly ($p = 0.001$) higher amounts of fish and seafood compared to other ethnicities, so as to male ($p = 0.026$) compared to female. Results for estimated weekly intake (EWI) were below 1.6 µg/kg BW/week, the tolerable levels recommended by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) for different demographic factors except for higher consumers (>75th percentile). Consumption of marine fish contributed to higher values of PTWI among adults but for adolescents, they were from consumption of crustaceans and cephalopods. The HQ values for consumption of fish and seafood by adolescents and elderly were >1, indicating risk of non-carcinogenic adverse health effects. Exposure in some cases was close to the safety margins and it is recommended for the demersal fish to be under frequent surveillance. Regular fish consumers are suggested to be caution in their consumption of seafood with higher levels of meHg but risk is significantly higher for high consumers.

OP1.23 Selection of human reference genome can impact genetic variant discovery in whole-exome sequencing

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Precision medicine is an emerging approach for disease treatment and prevention that considers individual variability in genes, environment, and lifestyle for each person. One of the methods to determine the variability in genes is using whole-exome sequencing (WES) technique. The objective of this study was to compare the performance of WES read alignment using two versions of human reference genome and the impact on genetic variant discovery. The germline short variant discovery pipeline was adapted from Genome Analysis Toolkit Best Practices Workflows. Reads were aligned to GRCh38_full and GRCh38_modified human reference genome. Germline short variants consisting of single nucleotide variant (SNV) and short insertion and deletion (indel) were identified through variant calling. When the reads were aligned to GRCh38_modified, additional 7.3% of SNV and 12.0% of indel were detected, as compared to reads aligned to GRCh38_full. Furthermore, higher coverage and better mapping quality were also observed. GRCh38_full contains alternate contigs, which are large variations with very long flanking sequences nearly identical to the primary assembly. Due to this, reads that originated from one locus, may map to either the primary assembly or the alternate contigs, creating multi-mapping reads with zero mapping quality. Low coverage and zero mapping quality could lead to false negative results. In conclusion, optimisation of WES pipeline is crucial for genetic variant discovery in precision medicine research and clinical diagnosis. The use of GRCh38_modified reference genome improved the read coverage and mapping quality, ultimately reducing false negative results.

OP1.24 Study of polycystic ovary syndrome in adolescents: mapping of research profile

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The aims of this scoping review are i) to summarise the available methods of diagnosing polycystic ovary syndrome (PCOS) among adolescents in epidemiological research; and ii) to identify the gaps in research on PCOS among adolescents. The scoping review was conducted according to the standard protocols by Arksey and O'Malley framework. Reporting of the review adheres the Preferred Reported Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 statement checklist. The search was restricted to English language only. Inclusion criteria were female adolescents aged 13 to 18 years old and articles published from January 2011 up to 7th February 2022. 286 articles were reviewed. The major challenge of PCOS studies among adolescents is the absence of adolescent-specific diagnostic criteria. PCOS studies in adolescents adopted three commonly used definitions for adult PCOS namely, i) the National Institutes of Health criteria; ii) the Rotterdam Criteria; and iii) the Androgen Excess and PCOS Society. Only two of our included studies used the recommended diagnosis of PCOS in adolescent girls by International Consortium of Paediatric Endocrinology (ICPE). Secondly, studies have shown that the risk of PCOS is influenced by ethnicity. However, only two studies were conducted in the South Eastern population. We suggest future study to evaluate the ICPE PCOS definition which was developed and recommended by an international panel of paediatric and endocrine experts. Regional adolescence PCOS studies especially in South Eastern is necessary to address the prevalence of PCOS in order to evaluate the current burden of the disease.

OP1.25 Sugar content in Malaysian food for the updates of Malaysian food composition database

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³Nutrition Society of Malaysia, 27C, Jalan PJS 1/48, Taman Petaling Utama, Petaling Jaya, Selangor, Malaysia. Sugar can be consumed through food and beverages. The overconsumption of sugar can lead to several disease namely obesity and diabetes. Hence, the objective of this study is to analyse the amount of sugar in the selected Malaysian foods and beverages. Subsequently this data will be used to update the current Malaysian Food Composition Database (FCD). Approximately 118 foods were selected from the Protocol for Sampling and Methods of Analysis for Malaysian Food Composition Database 2011. All the foods were divided into eight categories which are (i) cereal and cereal products; (ii) jam and jelly; (iii) traditional Malaysian *kuih* and cakes; (iv) beverages; (v) coffee, tea, and related products; (vi) milk and milk products; (vii) instant beverages premix high in added sugar; (viii) miscellaneous. The amount of sugar content was determined using High Performance Liquid Chromatography (HPLC) with Refractive Index (RI) Detector. This study showed that sucrose is the most common sugar content available in the cereal and cereal products, traditional Malaysian *kuih* and cakes and variety of beverages. Fructose and glucose were highly detected in jam and jelly and lactose was mostly found in milk and milk products. These findings can assist Malaysian in selecting healthy food choices for their daily intake and avoid the overconsumption of sugar.

OP1.27 Towards the development of ultra-high-throughput virtual screening platform for drug discovery

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Virtual screening (VS) technologies remain a vital cornerstone in the early stages of any drug discovery campaign. Proper validation and systematic use of ligand-based (LB) and structure-based (SB) VS technologies can identify hit or lead candidates that can be further investigated experimentally. In our work, we combined the use of LBVS, SBVS, and machine learning methods to identify inhibitors for clinically relevant drug targets. To demonstrate their utilities, we deployed VS in two cases: (a) discovering chemical compounds to inhibit AgrA, the global virulence regulator in *Staphylococcus aureus*, and (b) discovering chemical compounds to activate DspS, a biofilm regulator protein in *Pseudomonas aeruginosa*. Although both campaigns are in their early stages, the application of VS led us to discover an AgrA inhibitor that completely inhibited protein activity across different AgrA subtypes at 50 μ M. Additionally, we found seven DspS activators that triggered the dispersal of 40-60% of *P. aeruginosa* biofilm at 50 μ M. Furthermore, our drug discovery pipeline could identify dual-targeting inhibitors, as exemplified by our work on designing dual-targeting inhibitors for Polo-like Kinase 1 (PLK1) and p38 mitogen-activated protein kinase (p38 γ). In enzymatic assays, we discovered three dual-targeting inhibitors capable of inhibiting both PLK1 and p38 γ . The top dual-targeting inhibitor inhibited hepatocarcinoma cell lines Huh7 and HepG2 with IC₅₀ of 33.5 and 57.6 nM, respectively. Considering that the entire chemical space containing every chemical compound is estimated to be as large as 10⁶⁰, our future work would continue to focus on developing ultra-high throughput VS technologies (e.g., giga-docking) with the hope of identifying better inhibitors in terms of potency and novelty.

OP1.28 Understanding the relationship between inflammatory-related pathways in ankylosing spondylitis and its comorbidities using the network biology method

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Ankylosing spondylitis (AS) is an autoimmune and inflammatory arthritis linked with multiple comorbidities, including axial spondyloarthritis (axSpA), rheumatic fever (RF), Guillain-Barre syndrome (GBS), vasculitis (Vs), cardiovascular disease (CD), etc. We used network biology and computational methods to establish links between biological processes and molecular mechanisms (signalling, regulatory, and metabolic pathways) in AS and its



comorbidities and twelve shared pathways were identified. Shared pathways have common biological and cellular functions, which link the comorbidities. Extracellular matrix, JAK-STAT, innate immune system, B cell receptor, metabolism of proteins, and cytokines are significant pathways shared by AS and its comorbidities. These shared pathways are involved in the pathobiological processes involved in immune responses that activate the inflammatory responses and cellular signalling responsible in AS and its comorbidities. This work highlights unique and common shared pathways in AS and its comorbidities. These findings can provide molecular information that can be used in diagnostic discovery towards accurate diagnosis and effective treatment of AS. This study also provides the information on key shared pathways, which can be used to explain the pathobiological processes of AS and its comorbidities.

OP1.29 Utilisation of reverse vaccinology in identifying the antigenic proteins of *Acinetobacter baumannii*.

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Acinetobacter baumannii has emerged as one of the leading causes of healthcare-associated infections (HAIs). Over time, this bacterium has developed extensive resistance towards most antibiotics making the treatment more difficult. Vaccine against bacteria including *A. baumannii* has been acknowledged to reduce the incidence of antimicrobial resistance (AMR) and lowering the usage of antibiotics. To date, there are no vaccines available against the bacterium. Advancements in molecular technologies and high throughput genome sequencing have assisted the establishment of enormous genome databases, enabling the rational design of vaccines using the “reverse vaccinology” (RV) approach. The application of RV has assisted in the understanding of the biology of several pathogens, has led to the discovery of previously unknown antigens and contributed to the development of the universal *meningococcus* B vaccine. In this study, we have utilised a direct RV approach to identify the antigenic proteins with potential as vaccine targets to elicit a broad protective response. Here, the data of the outer membrane protein from 25 multidrug-resistant (MDR) *A. baumannii* complete genomes were retrieved from the PSORTb database, filtered, and analysed. Based on the analysed data, the protein sequences were downloaded, aligned, and further analysed for their antigenic properties. Initially, we started with 2462 outer membrane proteins with various functions. Following the stages of refinement analyses processes using RV approach, we have identified 24 antigenic proteins with potential as vaccine targets or for diagnostic purposes. In conclusion, the RV approach could facilitate the finding of vaccine targets quickly and efficiently.

OP1.30 Whole-genome-sequencing of SARS-CoV-2 from residual viral RNA present on positive rapid antigen test kit for genomic surveillance

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Coronavirus disease 2019 (COVID-19) is a highly infectious disease caused by its etiological agent, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The tracking of different SARS-CoV-2 variants is accomplished by performing whole-genome sequencing of the residual viral transport media (VTM) that tested positive for COVID-19 through real-time reverse-transcriptive polymerase chain reaction (RT-PCR). However, the adoption of a rapid antigen test kit (RTK-antigen) as the main COVID-19 diagnostic method has limited the number of patient samples in VTM available for whole-genome-sequencing. To circumvent this problem, many

groups have assessed the feasibility of extracting SARS-CoV-2 RNA from RTK-antigen cassettes. Therefore, we evaluated the extraction of SARS-CoV-2 RNA from 33 RTK-antigen cassettes and the success rate of whole-genome sequencing from these RNAs. Out of the 33 samples, 18 samples, which account for 54.5% of the total, were successfully sequenced with a reasonable genome coverage. Among those, 13 achieved more than 90% genome coverage, while the remaining five achieved 80-90% genome coverage. Lineage assignment was successful for all 18 samples. This demonstrates that SARS-CoV-2 RNA suitable for whole-genome sequencing can be recovered from positive RTK-antigen cassettes. Therefore, this work provides a proof-of-concept that positive RTK-antigen cassettes can be safely transported, stored, and subjected to whole-genome sequencing, enabling swift identification of circulating variants.



ORAL PRESENTATIONS: CLINICAL AND PUBLIC HEALTH

OP2.01 An audit on the diagnostic assessment of autism spectrum disorder and profiling of the children at the initial assessment at Hospital Tunku Azizah, Kuala Lumpur

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Autism Spectrum Disorder (ASD) is amongst one of the most prevalent neurodevelopmental disorders worldwide. Recommended standard of assessment is based on DSM-5, WHO ICD 10, and NICE Guidelines. As per our knowledge, this is the first audit in Malaysia on this topic. The objective was to audit the clinical notes of children attending Child Development Clinic for clinical and diagnostic assessment pathway against standards. Secondary objective was to evaluate comorbidities, carry out appropriate assessments and referrals. Source of data was patient's electronic medical records from August 2020 to July 2021 and entered in a data collection sheet. After auditing, feedback to staff was given, template created, and re-audited. 100 electronic records were accessed in the audit and reaudit. Most children (86%; 74%) were male and Malays. Reauditing showed improvement in diagnostic assessment within 3 months (46.9%; 67.3%), addressing carer's concern (34%; 90%), child's or young person's experience (32%; 90%) and medical history (10%; 30%). Information sharing (12%; 0%) and timely follow-up was well below the expected. Pertaining to the diagnosis, level of social communication, repetitive restrictive behaviour was documented, but not developmental or intellectual impairment (88%; 76%) and language (20%; 24%). Comorbidities, medical and functional difficulties were not built into the profile. On conclusion, there were improvements on re-audit, however, standards were not met. Almost all the child's strengths, skills and impairment were not established. Conduct qualitative analysis can be done to further explore reason(s) of not using tool kit for ASD diagnosis via focus group discussion. In-depth interview should be done to understand the root cause for more effective implementation in near future.

OP2.02 Analysis of diffusion tensor imaging of brain tumour: quantitative comparison of the indices

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The alteration of white matter tracts (WMT) caused by brain tumour could obstruct the neuroanatomical structure of the brain and eventually, affect the patients' neurological functions. Diffusion tensor imaging (DTI), a non-invasive neuroimaging technique, assists radiologists and neurosurgeons in the visualisation of WMT in vivo. This technique measures the diffusion movement of water molecules in an anisotropic event, resulting in the measurement of fractional anisotropy (FA), mean diffusivity (MD), axial diffusivity (AD), and radial diffusivity (RD). To evaluate the changes in WMT integrity, we quantitatively studied these DTI indices and compared them between the affected brain, its contralateral hemisphere, and the healthy control participants. Eight left brain tumour patients and thirty healthy control participants were recruited and agreed to be scanned through DTI. Corticospinal tracts (CST), inferior longitudinal fasciculus (ILF), and uncinat fasciculus (UF) were chosen as the targeted WMT and the tractography was reconstructed by automated tractography using DSI-Studio software.

The result indicated only in one tract, UF showed a significant difference in comparison between the affected and unaffected hemispheres of FA, MD, and RD, which showed FA significantly decreased whereas MD and RD increased. However, compared to healthy controls, there were significant differences shown only in the left hemisphere of CST for MD, AD and RD, and all indices for both left and right hemispheres of ILF and UF ($p < 0.05$). These indices could give specific indications of WMT integrity. Glioma growth in the brain could affect the integrity of WMT and alter its normal microstructural morphology.

OP2.05 Assessing non-communicable diseases distribution with small area estimation: a narrative review

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National-level surveys, like the National Health and Morbidity Survey (NHMS) in Malaysia, are commonly used for population health assessment. However, findings from these surveys were typically reported at the national or state level, and often lacked district-level results. This narrative review offers an overview of small area estimation (SAE) in non-communicable disease (NCD) distribution. It covers motivations, data sources, statistical methods, strengths, limitations, and future directions, providing a valuable resource for researchers and policymakers seeking to enhance local-level understanding and inform tailored interventions. For this narrative review, we synthesise studies using SAE to estimate NCD distribution by searching PubMed between 2013 and 2023. The search strategy included a combination of keywords, including “small area estimation” and common NCD such as hypertension, obesity, and diabetes. In this narrative review, we found that researchers often use SAE to understand health burdens and district-level variations. They commonly relied on national census data, national health surveys, and electronic records as data sources. Various statistical techniques were employed in SAE, including direct and indirect estimation and model-based approaches. Researchers frequently highlighted limitations such as sparse data, small sample sizes, and data quality issues. Future directions for SAE involve advancing modelling techniques, integrating spatial analysis for enhanced NCD mapping and risk assessment, and utilising data visualisation and dissemination methods. This narrative review is valuable for researchers and policymakers interested in applying SAE methods to gain a localised understanding of population health and identify district specific NCD patterns.

OP2.06 Association between ambient air pollution and lower respiratory infections among children in Klang Valley

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Air pollution is a significant environmental threat, particularly in urban areas. However, the impact of ambient air pollution on children's health, specifically in Malaysia, remains poorly studied. This study aimed to examine the relationship between ambient air pollution and hospitalisations and mortality due to lower respiratory infections (LRIs) among children in the Klang Valley, Malaysia. Data on daily hospital admissions and mortality for LRIs in children from 2010 to 2019 were obtained from the Ministry of Health and the Department of Statistics, respectively. Information on PM₁₀, PM_{2.5}, SO₂, NO₂, O₃, and CO in the study area was collected from the Department of Environment. Quasi-Poisson time series regressions with distributed lag models were employed to explore the associations between ambient air pollution and childhood hospitalisations and mortality related to LRIs. Stratified



analyses were conducted by gender and age group to identify vulnerable populations. Results showed that a 10 µg/m³ increase in SO₂, NO₂, and O₃ was associated with increased hospital admissions for LRIs among children, with the highest relative risk observed for SO₂ (RR 1.047, 95% CI 1.018–1.076) at lag 0–5 days, NO₂ (RR 1.010, 95% CI 1.000–1.020) at lag 0–6 days, and O₃ (RR 1.005, 95% CI 1.001–1.010) at lag 0–6 days. However, no significant association was found between ambient air pollution and LRI-related mortality. The study also revealed stronger associations in boys and younger children aged 0–4 years. These findings emphasise the need for improved air quality control to safeguard the health of children residing in urban areas of Malaysia.

OP2.07 Double burden of malnutrition among children and adolescents in Malaysia: National Health and Morbidity Survey 2019

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Malaysia faces the threat of a double burden of malnutrition where undernutrition and overnutrition coexist in the same population. This study aimed to determine the magnitude of the double burden of malnutrition among children and adolescents aged 5 to 17 years, and its association with socio-demographic factors. Data were extracted from the National Health and Morbidity Survey conducted in 2019. This cross-sectional survey applied a two-stage stratified sampling design. Socio-demographic characteristics were obtained. Body weight and height were measured, and z-scores for weight-for-age, height-for-age and BMI-for-age were computed to determine the nutritional status. Either one or both conditions, stunting, or thinness, was defined as undernutrition. While overnutrition was defined as overweight or obese. Being undernutrition and/or overnutrition would be defined as malnutrition. Complex sampling analysis was used to determine the prevalence, and logistic regression was used to determine the association. A total of 3,185 respondents were included in the analysis. Overall, the prevalence of undernutrition, overnutrition and malnutrition was 21.0%, 29.8% and 48.3%, respectively. Respondents living in rural areas were more likely of being undernutrition than those living in urban. Boys were more likely of being overnutrition than girls. Respondents aged 10 to 14 years were more likely of being overnutrition than those younger. There is growing evidence of the increasing prevalence of coexistence of undernutrition along with overweight and obesity among children and adolescents in Malaysia. The results emphasise the need to broaden the scope of nutrition guidelines, public health policies and programmes to address the double burden of malnutrition in Malaysia.

OP2.08 Durability of the Health Clinic Advisory Panel in Ministry of Health Malaysia

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The Health Clinic Advisory Panel also known as *Panel Penasihat Klinik Kesihatan* (PPKK) was established in 1955 at health clinics in the Ministry of Health Malaysia. This PPKK aims to encourage the involvement of the community who lives within the operationalization area of the respective health clinics as an intermediary between the Health Clinic and the Community. These PPKKs act as the driving force for the community in the aspect of health care through smart partnerships. Various health activities are carried out based on the local needs within states and communities. The members involved are mostly retired personnel, health clinic staff, and local EXCO members. The objective of this study is to showcase the involvement of the Health Clinic Advisory Panels in health clinics. It is a descriptive study. Secondary data was collected from the 15 states for the period of 1st October 2020 to 31st May 2022. The number of health facilities established by PPKK has increased to 982 facilities (93%) compared to the year 2018 (866 (79%) panels). The number of appointed members has increased by almost 51% since 2018 from 6652 members to 12,825 members in 2022. The Health Clinic Advisory Panel (HCAP) acts as an effective channel for community participation in health services, a major contribution to the well-being of community health and closer relationship with health clinic staff. To be an agent of change in providing health services for all in planning, implementing, and evaluating health activities related to the local community.

OP2.09 Exploring the Quranic perspective on food balance: understanding the significance of plant-based and animal-based foods

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A vegan and vegetarian diet is defined as a diet without animal products or a diet without meat. The vegetarian diet has become one of the dietary lifestyles for maintaining food-based health. Despite the benefits inherent in the vegetarian diet, there are still risks of diseases for vegetarian practitioners. This study aims to identify the Quranic perspective on the concept of food balance and the significance of balancing food sources in daily meals. The researcher used qualitative methods to analyse the content of Quranic verses related to nutrition with *Tafsir Mafatihul Ghayb* as the main interpretation along with other tafsir as supporting data. The researcher also conducts content analysis on health articles related to nutrition as references to enhance knowledge regarding the study. The study revealed that the Quran emphasizes food balance, promoting moderate consumption of plant-based and animal-based foods. It emphasizes the need for a balanced intake of these sources to meet nutritional needs and prevent nutrition-related diseases. The findings underline the significance of the following Quranic principles for achieving a well-rounded and healthy diet. The Quran's dietary recommendations support balanced plant and animal-based diets, promoting well-being and reducing nutrition-related disease burdens like non-communicable diseases (NCDs). The findings highlight the significance of incorporating Quranic principles in promoting optimal nutrition and overall well-being. Review diets for alignment with Islamic perspectives. Promote Islamic-based health studies for a comprehensive understanding of nutrition.

OP2.11 Incidence of adverse drug reaction (adr) towards nirmatrelvir/ ritonavir (Paxlovid®) among outpatient adult patients in Primary Healthcare Setting in Melaka

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Since early pandemic, several existing drug treatments have been recommended for the outpatient setting and home care management of COVID-19. The newly oral antiviral agent, Paxlovid has been introduced to treat mild-to-moderate COVID-19 in high-risk adults. Since the drug is relatively new to the market, information about its safety and effectiveness is limited. This study was aimed to establish the occurrence rate of ADR towards Paxlovid. A cross-sectional study was conducted in COVID-19 Assessment Centres (CAC) in health clinics across three districts in Melaka. Patients who were dispensed with Paxlovid from 1st May 2022 to 31st December 2022 were used as our sampling frame. A proportionate stratified random sampling was applied to obtain a sample population that best represents the entire population being studied. Descriptive statistic and Pearson Chi-Square test was conducted using IBM 22.0 software. Out of 536 patients included in our study, 415 (77.4%) of them developed ADR. Bitter taste was the main ADR (361; 67.4%), followed by diarrhoea (100; 18.7%), vomiting (26, 4.9%), dizziness (16; 3%) and muscle pain (12, 2.2%). Other minor ADR were also reported. The onset of ADR reported by patients can be as soon as few minutes after taking the first dose Paxlovid. Only age was significantly associated with risk of developing Paxlovid ADR (Pearson Chi-Square test (df): 4.236(1); p=0.027). ADR following Paxlovid treatment is minor and self-resolving in nature. To encourage ADR reporting among public, a user-friendly interface should be integrated into the MySejahtera application.



OP2.13 Medicine selection process for pharmaceutical pooled procurement initiative among ASEAN countries: a proposal from Malaysia

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Pooled procurement of medicines has gained much attention as it is believed to reduce prices and increase availability with greater efficiency throughout the procurement processes. Most ASEAN countries are persistently challenged to ensure adequate supply of quality assured and affordable medicines to the population. Hence, this initiative has potential to ensure drug security and self-reliance among ASEAN countries under the ASEAN Health Cluster III Work Plan for 2016-2020. The aim of this study was to systematically identify the list of medicines to be proposed for pooled procurement at ASEAN level. This was a retrospective mixed design study utilising secondary data analysis of the government medicine sales data by IQVIA Malaysia from 2020-2021 and inputs from expert panels' discussions. Data extracted for analysis include medicines with on-going patents and not listed in the national concession contract list (n=47). Multiple-criteria decision analysis (MCDA) was used to rank the medicines based on the following criteria: 1) highest total expenditure; 2) highest cost per unit; 3) highest procurement volume. 20 drugs were selected and presented to the expert panels from Ministry of Health, Malaysia. Most of the drugs were utilised for treatment of various cancers. Three drugs which were nilotinib, ustekinumab, and daratumumab were ranked in the first tier for all three criteria, with total annual expenditure between USD 414,715 and USD 5,826,400. Upon consultation, eleven items were successfully selected to be proposed for pooled procurement at ASEAN level using a scientific and systematic approach utilising medicine sales data for 2020 and 2021.

OP2.14 Nurses' knowledge of blood transfusion in a public hospital, Malaysia

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Blood transfusion is a critical procedure in healthcare, and the quality of care provided during the process is highly dependent on the knowledge and competence of nurses. Assessing the level of blood transfusion knowledge among Malaysian nurses is essential to identify any knowledge gaps and address them through targeted training programs. This cross-sectional survey was conducted among 316 nurses at a prominent public hospital in Kuala Lumpur, Malaysia, from February to March 2023. The participants completed a validated Routine Blood Transfusion Questionnaire administered through Google Form. The survey results revealed that majority of the participants were female (85.4%) and belonged to the 21-30 age group (54.7%). Most nurses had 5-10 years of work experience (44.6%) and held a diploma as their educational qualification (81.3%). Around 48.4% of participants were involved in monthly blood transfusion procedures, and 69.6% had received training in adverse response and post-transfusion care. Moreover, a significant proportion (90.5%) confirmed reading the blood transfusion policy. In terms of knowledge levels, the study found that 56.3% of nurses had good knowledge of blood transfusion procedures, 42.7% had moderate knowledge, and only 0.9% lacked knowledge. However, knowledge gaps were identified in pre-transfusion and post-transfusion adverse reaction management. In conclusion, while more than half of the surveyed nurses demonstrated adequate knowledge of blood transfusion procedures, there were notable gaps in specific areas. It is crucial to provide comprehensive education and training to enhance nurses' awareness and knowledge, particularly regarding pre-transfusion, post-transfusion care, and adverse reaction management.

OP2.15 Pepper Mild Mottle virus potential application for poliovirus environmental surveillance indicator

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The 2019 Malaysia Post-Polio Outbreak has impacted surveillance enhancement to detect and respond to potential poliovirus (PV) circulation. Strengthening monitoring and surveillance systems, including the National Polio Laboratory (NPL), is crucial for Environmental Surveillance for Poliovirus (ESPV). Pepper Mild Mottle Virus (PMMoV) is a widely accepted biological marker for human faecal pollution. To validate the detection of PMMoV by qRT-PCR test, the CFX96 (Biorad) Real-Time PCR detection system and standard protocols were used. Seven original sewage samples and processed samples from the ESPV program, which yielded NPEV results after concentration and inoculation into a specific cell line, were chosen. These samples aimed to identify significant differences in PMMoV detection. PMMoV was successfully detected in all NPEV samples. The Ct values for original samples (1 to 7) ranged from 28.68 to 31.76, while processed samples showed Ct values between 27.01 and 29.53. The higher Ct values in processed samples confirmed the reliability of the concentration method employed in the NPL laboratory. Considering qRT-PCR for PMMoV detection as a water quality indicator for ESPV site selection is valuable. This approach enables early detection of PV circulation, facilitating timely public health interventions like vaccination campaigns and enhanced surveillance activities.

OP2.16 Personal protective equipment use during the COVID-19: Malaysian healthcare workers experience

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Personal Protective Equipment (PPE) is one of the essential elements under the infection prevention and control strategies. The surge of COVID-19 cases has necessitated prolonged use of PPE among healthcare workers (HCWs), which may result in unpleasant experiences and challenges. Therefore, this study aimed to describe the PPE utilisation experience among HCWs in Ministry of Health (MOH) facilities. This cross-sectional study was conducted from February to March 2021. Data was collected using convenience sampling via an online validated questionnaire through multimodal recruitment. The questionnaire consisted of seven sociodemographic items and nine items to assess the HCWs' experience with PPE use, including the frequency of monitoring by the supervisor, shortage and quality of PPE, difficulties and adverse reactions following PPE use. This study included all the HCWs in the MOH facilities who worked directly with patients/ specimens/ close contacts. Descriptive analyses were performed using Statistical Package for Social Sciences (SPSS) 26.0. 3,132 respondents were analysed. 49.5% of the respondents reported that their supervisors always monitored their PPE usage, whereas 52% had experienced a PPE shortage. 81.3% of respondents have claimed to use poor quality PPE, while 84.8% reported having various difficulties upon using PPE. Additionally, 21.2% HCWs reported experiencing an adverse reaction to PPE use. A high proportion of HCWs experienced issues and challenges in PPE use. Future pandemic preparedness plans should comprise a clear feedback mechanism and a strong support system that facilitates PPE monitoring and use to ensure the well-being and safety of the HCWs and improve PPE availability and quality.



OP2.17 Prevalence of anxiety-induced sleep disturbance (AISD) and its associated factors among in-school adolescents in Malaysia: findings from The National Health Morbidity Survey (NHMS) 2022

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Mental disorders constitute a major burden among adolescents globally. However, research on anxiety-induced sleep disturbance (AISD) among Malaysian adolescents has received less attention. Therefore, this study aimed to determine the prevalence and factors associated with AISD among in-school adolescents in Malaysia. Data from the National Health and Morbidity Survey (NHMS) 2022: Adolescent Health Survey were analysed (n=33,513). It is a nationwide cross-sectional survey that applied a two-stage stratified random sampling design among a nationally representative sample of secondary school students in Malaysia. This survey utilised the Global School-Based Student Health Survey (GSHS) questionnaire. Descriptive and complex sample logistic regression analyses were performed using IBM SPSS version 28. The prevalence of AISD among in-school adolescents in Malaysia was 12.9% (95% CI:12.26,13.54). Multiple logistic regression analysis revealed that female adolescents (aOR 1.22, 95% CI:1.12,1.42), age 15 years (aOR 1.22, 95% CI:1.04,1.47), age 16 years (aOR 1.34, 95% CI:1.15,1.61), age 17 years (aOR 1.66, 95% CI:1.43,1.95), loneliness (aOR 2.81, 95% CI:2.68,3.28), and depression (aOR 5.10, 95% CI:4.79,6.02) were risk factors that were significantly associated with AISD. Furthermore, adolescents who reported having suicidal ideations (aOR 1.73, 95% CI:1.38,1.96) and suicidal plans (aOR 1.36, 95% CI:1.43,1.88) were also more likely to have AISD. This study found a high prevalence of AISD among in-school adolescents in Malaysia, with 1 in 10 affected. Compared to NHMS 2012 (5.4%) and NHMS 2017 (7.1%), the current rate shows a significant increase, highlighting the urgent need for targeted policies and interventions aimed at the most at-risk populations.

OP2.18 Prosthodontic management of resorbed maxillary and mandibular ridges: a case report

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Edentulism has significant impact on patient daily oral function and social interactions. A successful outcome of complete denture can improve the quality of life in edentulous patients. Retention, stability, and support are three basic principles on which the success of a complete denture relies on. However, proper retention and stability of conventional complete dentures in patients with generalised resorbed maxillary and mandibular ridges is difficult to achieve. This case report aims to highlight different impression techniques applied in a 51-year-old Malay lady with resorbed maxillary and mandibular ridges. For recording the maxillary ridge, a selective pressure impression technique with modified custom tray design has been used. A closed mouth impression technique for mandibular suction denture has been described. Vinyl Polysiloxane impression materials (VPS) in different viscosities are used. These techniques record maximum details of denture bearing mucosa leading to increase retention and stability of denture. Selective pressure impression techniques focus on controlling pressure exerted on the oral mucosa to provide superior results. Favourable amount and location of pressure produced during impression making will determine satisfactory outcome of the complete denture. Closed mouth technique allows the impression taken by the functional movement of the patients, creating the negative pressure that seals the border of the denture. The choice of impression material technique in complete denture is based on patient case selection. Hence, patients' best interest and quality of life can be upheld.

OP2.19 Risk and protective factors associated with depression among adolescents in Malaysia

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Depression is a common mental health issue seen worldwide and in Malaysia, with increasing rates among adolescents. This study aims to identify the risk and protective factors linked to depression in Malaysian adolescents. Data from the 2022 National Health and Morbidity Survey (NHMS): Adolescent Health Survey, a nationwide cross-sectional survey using a two-stage stratified random sampling design, was analysed. The survey included a representative sample of secondary school students. Depression was measured using the Patient Health Questionnaire (PHQ-9), with a score of 10 or higher indicating depression. Descriptive and complex sample logistic regression analyses were performed using SPSS version 26.0. This study involved 33,523 school-going adolescents, and the prevalence of depression was 26.9%. Multiple logistic regression analysis revealed that female adolescents and those in higher academic forms had a higher likelihood of experiencing depression. Conversely, Chinese and Indian adolescents were less likely to experience depression. Adolescents whose parents were separated, widowed, or widower, those who experienced loneliness, lacked a close friend, had sleep difficulties, were bullied, engaged in truancy, or had a lack of parental bonding or connectedness exhibited a higher likelihood of experiencing depression. Depression is a significant issue among Malaysian school-going adolescents, with a prevalence rate of one in four. Risk factors identified include gender, academic level, family structure, social relationships, sleep patterns, bullying, truancy, and lack of parental bonding. To enhance mental health and well-being, it is crucial to develop targeted prevention and intervention programs for at-risk adolescents.

OP2.21 The emergence of influenza B virus in Malaysia: a concern?

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Influenza B causes significant public health threats. However, lack of awareness on its severity due to the low potential to cause pandemic. This retrospective study aims to determine the demographic and prevalence of severe acute respiratory infection (SARI) caused by Influenza B from recent cases in Malaysia. The SARI samples from sentinel hospitals received at our unit for duration of January 2022 to June 2023 were used in the study. The viral RNA was extracted and subjected to real-time reverse transcription polymerase chain reaction (qRT-PCR) using (Flu SC2) Multiplex Assay Primer (CDC). Samples tested as Influenza B positive were further subtyped using in-house RT-PCR assay for B/Yamagata and B/Victoria. A total of 3717 SARI cases were tested and 175 (4.7%) patients were confirmed positive for Influenza B. This comprises samples from 2022 of 42 cases (24.0%) and samples from 2023 (until June) of 133 (76.0%). Majority of the positive samples in 2023 are from Influenza B/Victoria lineage; 163 (93.1%), while 12 samples (6.9%) were non-typeable. Influenza B/Yamagata is not detected. Most of the infected patients were adults (86/175;49.1%), followed by paediatrics (54/175; 30.9%), adolescents (8/175;4.6%), and geriatrics (27/175;15.4%). Malaysia's southern region has the most infective cases (72/175: 41.1%), followed by the northern region (45/175:25.7%), Klang Valley (17/175; 10.9%), and east Malaysia (17/175; 9.7%). The increase of Influenza B cases has tripled in 2023 should be addressed and given serious attention. The prevention policies such as introduction of vaccines to children and high-risk groups besides implementation of mitigation measures are important to prevent future outbreaks.



OP2.23 Ultrasonographic evaluation of breast tissue toxicity following radiotherapy of breast cancer

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Acute radiation breast toxicities, especially skin toxicities, are common and distressing side effects and are routinely evaluated using subjective assessments with high inter and intra-observer variability. This study aimed to evaluate acute breast tissue toxicities following radiotherapy (RT) using ultrasound (US) and correlate them with patient-reported breast symptoms. Twenty-one Malaysian women with unilateral breast cancer treated with lumpectomy (n=15) or mastectomy (n=6) followed by 3D conformal RT were recruited into this ethically approved study (UKM PPI/111/8/JEP-2022-307). B-mode US parameters, including skin thickness, fluid accumulation, and visibility of the dermis-subcutaneous fat border were taken from the four quadrants of the treated and untreated breasts at baseline and during RT. Breast symptoms were also evaluated using the EORTC QLQ BR-45 quality of life questionnaire and compared with the ultrasound parameters. The results showed a statistically significant increase in the mean values of the four quadrants of the measured parameters and some quadrants only during RT compared to baseline ($p < 0.05$). However, there were also significant changes in the mean values of all quadrants of these parameters at baseline relative to the untreated breast ($p < 0.01$) attributed to postoperative changes. Furthermore, there was a significant increase in the mean breast symptoms score during RT compared to baseline ($p = 0.002$). However, it was weakly correlated with the US changes. Breast ultrasound is a useful, non-invasive, and objective technique in evaluating acute radiation breast toxicities. Yet, the measurable US changes did not reliably reflect breast symptoms scored by the patients for the available sample size.

ORAL PRESENTATIONS: HEALTH SYSTEMS AND MANAGEMENT

OP3.01 Advancing nursing care quality in Malaysia: insights and recommendations for future indicators from a collaborative workshop

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Nursing-sensitive indicators (NSIs) measure and evaluate nursing care quality and its contribution to patient care. This abstract aims to identify these domains based on nurses' perspectives for the development of NSIs at a national level. An environmental scan was conducted through a two-day workshop, which involved an interactive process of engaging nurses throughout Malaysia from various disciplines and levels of care. The sessions encompassed moderated-group discussions that aimed to solicit feedback on NSIs gathered previously through scientific and grey literature review. Participants were introduced to the selection criteria for indicators to prioritise for NSI development. The nursing staff supply domain was unanimously identified as crucial for prioritisation. Participants also strongly resonated with the nursing processes domain as the workshop captured the extensive scope of nursing workload. This prompted suggestions to streamline work processes and include NSIs that more accurately reflect their profession. Additionally, from the promotion and prevention domain, indicators such as immunisation and cancer screening measures, were chosen to further exemplify their contribution to patient care. From the perspective of the care outcomes domain, indicators such as medication administration errors, falls, and pressure injuries were highlighted as vital SIs. The discussions identified specific areas or domains with indicators reflecting the contribution of nursing care in the country. The selection of indicators within these areas of concern that capture the profound impact wielded by the nursing profession is relevant to translating nurses' contribution to patient care.

OP3 .02 Approaches and lessons learned in identifying critical areas of concern for national-level nursing-sensitive indicator development

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Developing nursing-sensitive indicators is crucial in improving nursing care quality and patient outcomes. One of the core steps in indicator development is identifying critical areas of concern. This study provides an overview of the approaches applied and highlights key lessons learned in identifying these critical areas. The study used an iterative and multi-method approach, adapting core steps for developing healthcare quality indicators to develop a conceptual framework and engaging diverse stakeholders throughout the study. It involved a comprehensive



review of international nursing-sensitive indicators supplemented with context-specific indicators relevant to the Malaysian healthcare system. Stakeholder engagements included discussions, dialogue sessions, and workshops with nurses from various disciplines, policymakers, and researchers. Involving 57 nursing stakeholders representing hospitals, primary care, district, state, and national levels, this study developed and refined a framework comprising three critical areas and more than 100 sub-areas. The identified critical areas aligned with the framework but were contextualised based on nurses' unique needs. They included resource allocation based on different levels of care and emphasised the importance of balancing direct patient care with activities like patient accompaniment and transportation. The key lessons learned are: (a) combining international and context-specific indicators supports comprehensive assessment and development of national-level indicators, and (b) stakeholder engagement enhances relevance and applicability of identified critical areas. The study highlights the iterative approach in identifying critical areas of concern and presents key lessons learned, emphasising the importance of stakeholder engagement through a collaborative process.

OP3.03 Electroencephalography for inner speech recognition using deep learning

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Inner speech, a cognitive process involving mentally articulating phrases without vocalizing or making facial expressions, holds promise for addressing communication challenges faced by individuals with disabilities. However, inner speech signals captured using electroencephalography (EEG) suffer from contamination by external noise, and a mix of genuine brain impulses and artifacts. This study focuses on investigating the reliability of EEG signals during inner speech tasks and proposes model to classification the inner speech signals. This study used filters to remove external noise and utilised Independent Component Analysis (ICA) to separate internal components and isolating the unadulterated inner speech signal. Additionally, with developing a deep learning model based on 2D Convolutional Neural Networks (CNNs) using Python Programming language to classify and recognize four Spanish words: "arriba" (up), "abajo" (down), "derecha" (right), and "izquierda" (left), were collected from online dataset which contain 2236 trails from ten participants, and the model was trained and evaluated accordingly. The results demonstrate that, albeit with some limitations, ICA technique improved the EEG signal and get clearer, the trained model of 2D CNNs architecture classified the words satisfactorily and prove that EEG signals derived from the internal dynamics of the human brain hold the potential for speech recognition. This study discusses findings, highlights the associated limitations, and provides recommendations for further research.

OP3.04 From good intentions to great results: an evaluation of the completing cancer treatment incentive (CCTI) policy in Malaysia

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Cancer poses significant challenges affecting individuals and families emotionally, physically, and financially. In realization of it, Malaysian government introduced *Skim Peduli Kesihatan PeKa untuk Kumpulan B40 (PeKa*

B40) which aim to sustain the healthcare needs of low-income groups focusing on non-communicable diseases (NCDs). PeKa B40 has four benefits and one of it is Completing Cancer Treatment Incentive (CCTI) which intended to encourage cancer patients to complete their treatment and to alleviate the financial burden. Our study aims to assess the CCTI's uptake and explore the experiences of both healthcare providers (HCPs) and patients involved, using a mixed-method approach. We conducted secondary data analysis and online interviews with patients and HCPs. Transcripts were analysed and themes were deductively formed accordance to RE-AIM framework. Findings revealed a 14.8% uptake in 2019, declining to 4.6% the following year. Although the CCTI was perceived as beneficial, improvements in implementation were necessary. To enhance the program, we recommend strengthening training, recruitment, and application processes. HCPs should receive better training to effectively communicate the program's benefits. The process for patient recruitment needs to be emphasize and closely monitored and reduction of current requirement in the application process are necessary. Visibility of this incentive to improve accessibility of the CCTI is also crucial. While the CCTI has the potential to alleviate the financial burden for low-income cancer patients, our study emphasizes the need for program improvements to benefit a larger population. We offer valuable insights from patients and HCPs involved in the CCTI, highlighting areas for enhancement.

OP3.06 Prophylactic intravenous metoclopramide use in patients given intravenous tramadol: a retrospective cross-sectional study [TRAMAX STUDY]

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The routine use of Intravenous prophylactic antiemetics with Intravenous opioid analgesics is common practice in the Emergency & Trauma Department (ETD) of Hospital Tuanku Ampuan Najihah (HTAN) to prevent opioid-induced nausea and vomiting. However, this practice has dubious clinical benefits, generates additional costs, and might expose patients to potentially adverse effects. Approximately 6000 ampules of IV Metoclopramide are used by ETD HTAN annually. The sum seems ignorable, but in 10 years, this may total over RM 100,000. The study aimed to evaluate the benefit of intravenous metoclopramide prophylaxis in patients receiving intravenous tramadol for acute pain relief. A retrospective cross-sectional study was conducted at the ETD of HTAN using convenient sampling. Patient details were extracted from the medical record via standardized data collection form and analyzed with the Statistical Package for Social Sciences version 25. A total of 272 patients were included, half of whom were given intravenous Metoclopramide prophylactically. The overall incidence of nausea in the study population was 12.1%, with most cases rated mild. Only two patients (0.7%) in the metoclopramide group vomited within 2 hours of intravenous tramadol administration, which did not demonstrate a statistically significant association between metoclopramide prophylaxis and reduced emesis episode ($p= 0.498$, Fisher's exact test). Based on the study, intravenous Metoclopramide is no longer recommended as prophylaxis for tramadol-treated patients due to low incidence of nausea and vomiting. Usage has been greatly reduced, and education will be extended to cluster hospitals to reciprocate appropriate adherence to evidence-based prescribing practices.

OP3.07 The economic burden of oral cancer in Malaysia.

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Oral cancer has a significant disease burden in Malaysia, contributed by a high incidence and mortality rate. It not only affects the patients and their families but also has wider socioeconomic implications. This study thus attempts to estimate the economic burden of oral cancer in Malaysia. A prevalence-based cost-of-illness approach was adopted to estimate the direct and indirect costs of oral cancer. The first phase consisted of an activity-based costing study and a cross-sectional patient survey in two tertiary public hospitals. The data were analyzed to generate public healthcare provider costs, patient and household out-of-pocket expenditures, and loss of productivity cost from absenteeism. Next, national oral cancer registry data from 2012 to 2016 were obtained. Unit costs from the earlier phase were applied by stratifying the patient list by cancer stages and treatment types. Lastly, productivity losses from premature death were estimated using the number of years lost and employment data from the Malaysian Department of Statistics. There was a total of 2,525 incidences of oral cancer over the period of five years, with 62.5% of them diagnosed at stages III and IV. This corresponded to an economic burden of MYR 141,450,579, most of which (59.2%) was contributed by healthcare provider costs. This was followed by the cost of productivity loss from premature death (23.0%), productivity loss from absenteeism (0.1%), and patient out-of-pocket expenditures (0.1%). Understanding the high cost of oral cancer can inform policy decisions on resource allocations and preventive measures to mitigate its impact on the society and economy.

POSTER PRESENTATIONS: BIOMEDICAL SCIENCES

PP1.01 Inversion 16 among acute myeloid leukaemia patients in Institute for Medical Research Malaysia

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Inversion 16 or inv (16) is a type of chromosomal abnormality that occurs in some Acute Myeloid Leukaemia (AML) cases. In inv (16), the core binding factor β (CBF β) fused to the smooth muscle myosin heavy chain (MYH11) at the same breakpoints of chromosome 16 resulted in gene transcription dysregulation leading to the development of leukaemia. In this study, the frequency of the inv (16) cases among AML patients reported by the Institute for Medical Research (IMR) from year 2008 to 2022 was documented. RNA extraction and cDNA synthesis were performed from peripheral blood or bone marrow, and proceeded to real-time polymerase chain reaction using Hemavision -28N or Quandx. The Hemavision -28N is able to detect 12 types of inv (16) fusion with different breakpoint. From a total of 2662 AML cases, 94 (frequency=3.5%) samples were identified having inv (16). Male is more affected compared to female and the median age is 27 years old. 74% cases are from patients age 14 years old and above. The CBF β MYH11(A) is the most common (n=93: 98.4%) breakpoint subtype and there is only one (1.6%) case with CBF β MYH11(B) identified. The incidence of inv (16) was reported to have a favourable prognosis. Although some study showed the inv 16 subtype is an independent prognostic parameter in AML, extensive study may be needed to establish the clinical significance of this subtypes in correlation with patient's clinical background, morphology, and biological parameter. In conclusion, future studies using larger samples cohort are required to evaluate the prognostic impact of these variable subtypes of inv (16) AML.

PP1.02 A multicentre study during the fourth wave of COVID-19, Malaysia

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The SARS-CoV-2 virus caused the global COVID-19 pandemic and recently ended after causing a huge impact on health, economics, mortality rate, and raised social challenges. This study has been conducted with the intention of providing the data of COVID-19 pandemic during the fourth wave. In this population-based cross-sectional study, we have analysed the subject's record from the multicentre clinics that has been located in Klang valley, Malaysia. 58,942 subjects were recorded from the data from May 2021 until October 2021. The demographic characteristics of the subjects recruited were tabulated and presented. Chi-squared test was used to compare the proportions of categorical variables. Among the 58,942 subjects analysed, 10,949 (18.6%) number of subjects were infected with COVID-19 positive. Whereas 47,994 (81.4%) were not infected with COVID-19 during the period. The mean age of the overall detected with COVID-19 subjects were 34.5 \pm 15.9. Among the overall subjects, male (36,789, 62.4%) were higher than the females (22,126, 37.5%). Among COVID-19 subjects, male (6,742, 11.4%) was infected more than females (4,198, 7.1%). There is a significant difference between the gender among the COVID-19 subjects (p<0.05). The higher rate of tests was observed during August 2021 (19,710, 33.44%) followed by September 2021 (9,515, 16.14). This study needs further analysis on the vaccination status, clinical manifestations, and the severity of the disease. However, the findings showed that there is high number of infected rates during the fourth wave has been observed.

**PP1.03 A neglected practice of paired sera in the serodiagnosis of leptospirosis**

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Leptospirosis case confirmation rely on positive result of either *Leptospira* microscopic agglutination test (MAT), *Leptospira* PCR or culture. *Leptospira* MAT is the gold standard for serodiagnosis of leptospirosis that detects total agglutinating antibodies against a panel of live *Leptospira* serovars. Paired sera are advocated as the best sample for serological diagnosis of leptospirosis but limitedly practiced in clinical setting. This study aimed to demonstrate the significance of paired sampling for diagnosis of leptospirosis from a referral laboratory perspective. MAT was performed using an extended WHO panel comprising of 20 serovars and 4 strain of *Leptospira* species. A single high titer ($\geq 1:400$) in a single serum specimen is regarded as serological positive for *Leptospira*, or a demonstration of four-fold rise in titre in paired sera. In 2022, only 65 paired sera (8.5%) were received from a total of 1524 serum samples of suspected leptospirosis cases at our centre. Paired sera increase leptospirosis case confirmation in 9 out of 65 cases (13.8%) in which the initial MAT samples were negative or inconclusive. Our data demonstrated seroconversion to positive MAT occur as early as 5 days difference from the first MAT samples with cross-reactivity among tested serovars ranging from 1 to maximum 11 serovars. None of the positive seroconverted cases showed reduced number of cross-reactivity. These data support that paired sera for *Leptospira* MAT improved diagnosis of leptospirosis significantly and should be a standard investigation in leptospirosis suspicious cases.

PP1.05 Adenosquamous carcinoma of the maxilla: a rare case report

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Adenosquamous carcinoma is an uncommon malignant neoplasm displaying histopathological features characteristic of both squamous carcinoma and adenocarcinoma. A definitive diagnosis requires thorough histopathological examination of a deep biopsy involving submucosal tissue. This tumour exhibits an aggressive behaviour, characterized by early invasive growth and an unfavourable prognosis. Given the tumour's behaviour and prognostic implications, achieving an accurate diagnosis is of paramount importance, although it can be inherently challenging, particularly when dealing with limited biopsy specimens. In this report, we present a rare case of adenosquamous carcinoma affecting the right maxilla of a male patient in his sixth decade. Notably, the initial biopsy did not capture the distinctive mucous cells indicative of glandular differentiation, as well as the presence of squamous cell carcinoma. However, these components were readily discernible in the subsequent surgical specimen. Our report discusses the histopathological findings and presents the differential diagnosis for adenosquamous carcinoma arising in the maxilla.

PP1.07 Antibacterial activity of 1'S-1'-acetoxychavicol acetate against selected oral opportunistic pathogens

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Aspiration pneumonia (AP) is a concerning complication among immunocompromised individuals. AP occurs when substances containing oral opportunistic pathogens, such as saliva, gastric contents, food residuals, or oral microbiome, are aspirated and inhaled into the lungs, leading to infection. Physicians have recommended the use of mouthwash as a preventive measure against the incidence. However, the incorporation of chemical substances in mouthwash may cause teeth staining, reduced taste sensation, and increased formation of supragingival calculus.

Therefore, the antibacterial activity of 1'S-1'-acetoxychavicol acetate (ACA) isolated from the rhizome of *Alpinia conchigera* Griff., a Malay herbal plant collected from Jeli, Kelantan and cultivate in Ulu Langat, Selangor, was evaluated against selected oral opportunistic pathogens using minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC), and time-kill assays. Cefepime and chlorhexidine were used as controls for these assays. The morphology and ultrastructure of selected oral opportunistic pathogen were observed under Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM). ACA demonstrated good antibacterial activity against both the ATCC strain and clinical isolate of *Streptococcus pneumoniae* with an MIC and MBC value of 12.50 mg/mL. After 4 and 5 hours of treatment, ACA exhibited both bacteriostatic and bactericidal activity against ATCC and clinical strains of *S. pneumoniae*, respectively, at concentration of 12.50 mg/mL. The morphology and structure of clinical isolate of *S. pneumoniae* were disrupted after 4 and 5 hours of treatment with ACA.

PP1.08 Antimalarial drug activity: molecular modelling and docking simulation approach of artemisinin on Kelch-13 binding site

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A *Plasmodium falciparum* Kelch-13 (PfK13) protein mutation is associated with Artemisinin resistance. The emergence of this drug-resistant parasite in multiple countries, particularly Southeast Asia, has raised concerns about the global emergence and spread of resistant parasites. This study uses computer-aided methods to develop a model structure for PfK13 and evaluate its binding energy during the interaction between PfK13 and Artemisinin. Using Rama-Z scores, four distinct mutant protein types (V494I, L598G, S600C, and N537I) were evaluated and compared to the K13 wild-type protein. All protein mutants have higher binding energies than the wild-type protein (-9.65 kcal/mol), including V494I (-6.79 kcal/mol), L598G (-9.26 kcal/mol), S600C (-6.17 kcal/mol), and N537I (-6.96 kcal/mol). All four mutant proteins formed fewer stable complexes, indicating they are more resistant to Artemisinin than the K13 wild-type protein due to their higher binding energies. However, additional research is required to fully comprehend the binding interactions because all mutations have more protein-ligand hydrophobic interactions and protein-ligand hydrogen bonds than wild-type proteins. His study has paved the way for a better understanding of how mutations may lead to parasite drug resistance to Artemisinin.

PP1.09 Assessment of T-cell immune response in recovered COVID-19 patients after the first dose of BNT162b2, CoronaVac and ChAdOx1 vaccines

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The COVID-19 pandemic caused by SARS-CoV-2 has spurred the development and use of vaccines. While extensive research has focused on antibody responses, comprehending T-cell response is equally critical. T-cell is pivotal in identifying and eliminating infected cells, establishing long-term immune memory, and contributing to cellular immune responses. This study assessed T-cell immune response robustness in recovered COVID-19 patients following the initial dose of BNT162b2, CoronaVac or ChAdOx1 vaccines. The blood was collected before receiving the first dose (baseline) and before the second dose of the vaccine. We employed an enzyme-linked immunoSpot (ELISpot) assay to assess the T-cell response in a cohort of 145 recovered COVID-19 patients. Peripheral blood mononuclear cells (PBMCs) were stimulated with SARS-CoV-2 peptides, and the secretion of interferon-gamma (IFN- γ) was quantified as spot-forming units (SFU)/106 PBMCs using EliSpot plate reader. The T-cell reactivity was observed in 100% of the cohort at baseline and before receiving the second dose. The median of the T-cell response at the baseline was 116 (interquartile range (IQR); 84-184), 90 (IQR; 68-120) and 96 (IQR; 70-138) SFU/106 PBMCs for BNT162b2, CoronaVac and ChAdOx1, respectively. Subsequently, before receiving the second dose, significant increases ($p < 0.05$) in T-cell response were observed with a median of 684 (IQR; 498-1046), 272 (IQR; 200-348), and 416 (IQR; 344-512) SFU/106 PBMCs for BNT162b2, CoronaVac, and ChAdOx1, respectively. These results indicated that individuals previously infected with SARS-CoV-2 possess a robust cellular immune response that is effectively reactivated upon one vaccination dose, regardless of the type of vaccine they received.

PP1.10 Bibliometric analysis of tropical biomedicine publication trend

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The first bibliometric analysis for Tropical Biomedicine journals was conducted. The objectives of the analysis were to determine the distribution, trends, and impact of the published papers in the Tropical Biomedicine from 2004 to 2022. Scopus search and VOSviewer were used for our analysis. These papers were divided into few types including mainly original articles, short communications, and reviews. From the analysis, the most frequent words in the title were *albopictus* and *Plasmodium falciparum*. Both were vector and parasite causing fatal diseases. The most active authors were Abu Hassan and Mak by VOSviewer. Single authorship was 1.54% whereas more than five authorship was 41.64%. The most active country was Malaysia mainly by University of Malaya scientists, followed by Institute for Medical Research, University of Sciences Malaysia, and University of Putra Malaysia. There were increases in the publication from year to year but marked reduction during COVID-19 pandemic. The total citation recorded by this journal was 13,148 with H-index 38, which was high. The analysis will be useful for improvement of research focus and direction, and to attract more medical research funding.

PP1.11 Bibliometric analysis of IMR publication for the year 2000 to 2019

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Bibliometric analysis is a measure of the growth rate and impact of science research of an institute, an author, a topic, and other subject areas. This is the first bibliometric analysis for IMR, zooming in the recent 20 years'

achievements (from the year 2000 to 2019). The study objectives are to identify general description trend of the publications, top articles with highest citation, authors, subject areas. The data were sourced from Scopus database. The relative growth rate, doubling time, collaborative index and collaborate coefficient were conducted with Microsoft Excel, while the clustering analyses was conducted using VoSViewer software. From the year 2000 to 2019, IMR published a total of 1,244 articles with the total citations of 22,336. The increasing trend of publications, from 22 articles (year 2000) to 128 articles (year 2019) showed the steady growing rate of 14 articles in the recent five years (year 2015 to 2019). The collaboration coefficient of the authorship was 0.79, with Dr Lee Han Lim as the most prolific author (h-index of 27). The top subject areas included clinical study, virus, aedes and plant leaf. The high collaboration coefficient of IMR indicated that 79% of the publications were contributed by the multiple co-authorship, that is also a good sign of collaboration network with other institutes, universities from locally and internationally. The IMR's research publication will be the source of knowledge for the future generations. IMR continue to serve as the research arm of the National Institutes of Health, Ministry of Health Malaysia.

PP1.12 *Brucea javanica* extract induce apoptosis in late-stage prostate cancer cell lines

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Prostate cancer progression is controlled by hormone therapy at the early stage, but the late stage is androgen independent. *Brucea javanica* (L.) Merr. (*Simaroubaceae*) is a plant that was reported to possess broad spectrum anticancer properties. This study was conducted to determine the apoptotic and necrotic cell death of the plant root dichloromethane (DCM) extract against LNCaP (androgen sensitive) and DU145 (androgen independent) cells. *Brucea javanica* root DCM crude extract and its fractions were analysed against LNCaP and DU145 cells at its IC₂₅, IC₅₀ and IC₇₅ concentrations as predetermined from our previous study. Briefly, LNCaP and DU145 cells were grown and seeded using standard procedures. After 24 hours incubations, the cells were exposed to the crude extract and its fractions at the respective IC values for 72 hours at 37°C. Cells were then harvested and subjected to FITC-Annexin V apoptosis assay. Apoptotic and necrotic cells were analysed by flow cytometry. The IC values ranging from 50.2 ng/mL to 11021 ng/mL for LNCaP cells and 1.24 ng/mL to 2029.7 ng/mL for DU145 cells indicate antiproliferative activity measured using ATP assay. All the tested plant extract and its fractions caused necrosis in LNCaP cells while inducing apoptosis in DU145 cells. For cancer patients, cancer cell elimination through apoptosis is sought after to avoid inflammation due to cell necrosis. Future studies should include analysis after 24 hours incubation and other apoptosis assays, Caspase-3 and TUNEL assay, to confirm the apoptotic cell death as opposed to necrotic cell death caused by the plant extract.

PP1.13 Building a solid foundation: role of Malaysian Herbal Monograph in empowering the herbal industry

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Herbs used as traditional medicine come in various preparations. The herbal industry in Malaysia is estimated to grow at a rate of 15 percent per annum, with the market value rising from USD 1.6 billion in 2010 to USD 6.9 billion by 2020. Therefore, it is important to ensure that the herbal products marketed are of quality that meets the regulatory standards. In view of the potential of the herbal industry as well as the consumer's demand for high-valued herbal products, the government of Malaysia recognizes the need to ensure the herbal products can



be marketed locally and internationally through its quality, safety, and efficacy. The Malaysian Herbal Monograph (MHM) committee was established in 2011 to streamline the development process of plant monographs to assist herbal industries in their product preparations through authentication of the raw materials. Development of herbal monographs consists of several processes: sample selection based on available marketed products, collection, and processing of herbal raw materials, identification tests, quality control (purity and safety testing), toxicology studies, and conducting literature review on chemical constituents, traditional uses, and pharmacological action. This joint effort among research institutions, government regulatory agencies, universities, and statutory bodies has produced a total of 79 monographs which are available at the Global Information Hub on Integrated Medicine website. In conclusion, herbal monograph serves as an invaluable tool in the herbal industry, providing comprehensive and authoritative guidance that navigates practitioners, manufacturers, and consumers through the vast array of herbal products, their properties, and appropriate usage.

PP1.14 Can human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) detect doxorubicin cardiotoxicity?

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Cardiovascular toxicity is the primary cause of death among cancer survivors and has become increasingly prevalent due to improved cancer survival rates. Among the treatments used for cancer regimes are anthracycline drugs; doxorubicin (DOX). Doxorubicin cardiotoxicity may restrict the efficacy of cancer therapies in the acute (i.e., during treatment) and chronic (after long-term treatment). As such many patients will survive from cancer but die of heart disease. We propose to demonstrate that human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) can detect Doxorubicin-induced cardiotoxicity (DIC) in the laboratory. Using induced pluripotent stem cells culture system and differentiation method into beating cardiomyocytes (cardiac cells), the effects of DOX were evaluated in short and long-term incubation for 30 minutes, 2, 6, 12, and 24 hours. The short-term treatment failed to detect significant changes. While long-term exposure to 100 µM doxorubicin caused the cells to reduce in beat rate, contraction amplitude, and contraction time after 12 hours of DOX treatment, with increased in relaxation time at 2 hours after treatment. As such, the effects of hiPSC-CMs treated with doxorubicin can be observed after long-term exposure. The next direction would be to test DOX in Malaysia-owned derive hiPSC-CMs that consist of healthy and cancer-diseased individuals. These results suggest integrating hiPSC-CMs into cardio-oncology will allow more precise and cost-effective prediction tools for better therapy decisions before, during, and after cancer treatment. Hence providing some insight into cardiac safety and theoretically, able to guide the policy of using doxorubicin in cancer treatment.

PP1.15 Cellular response of BNT162b2 and CoronaVac vaccines in naïve individuals after booster

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The SARS-CoV-2 mRNA vaccine and inactivated viral vaccine are notable vaccine platforms that have played pivotal roles in global immunization campaigns, including Malaysia. As COVID-19 antibodies wane, strong

and durable cellular immunity becomes vital for long-term protection and preventing diseases. Therefore, this study aimed to determine the T-cell response in naïve recipients after receiving booster shot. A total of 50 naïve individuals who received the BNT162b2 and CoronaVac vaccine donated their blood before vaccination, three weeks after the first dose, two weeks after the second dose, and six months after the first dose. Peripheral blood mononuclear cells (PBMCs) were isolated and tested to produce interferon-gamma (IFN- γ) in response to SARS-CoV-2 peptides using an enzyme-linked immunospot (ELISpot) assay. At baseline, both BNT162b2 and CoronaVac vaccine recipients exhibited no T-cell reactivity. After the first dose, T-cell response was observed in 100% (24/24) of BNT162b2 recipients and 96% (25/26) of CoronaVac recipients. T-cell reactivity escalated after the second dose, with a median of 488 (interquartile range (IQR); 418-744) and 214 (IQR; 144- 316) spot forming unit (SFU)/106 PBMCs for BNT162b2 and CoronaVac, respectively. These responses persisted after receiving a booster shot. The T-cell response was significantly higher ($p < 0.05$) in boosted recipients ($n = 17$) compared to non-boosted recipients ($n = 9$) for both vaccines. Hence, it is suggested that taking a booster dose can enhance their cellular immune response against SARS-CoV-2, regardless of the type of primary vaccine administered. Consequently, administering a booster vaccine dose may contribute to achieving herd immunity and reducing COVID-19 disease severity.

PP1.16 Cloning and expression of *Plasmodium falciparum* lactate dehydrogenase (pLDH) in *Escherichia coli* BL21 (DE3) for anti-malarial drug discovery

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Parasite depends solely on glycolysis pathway for its survival in mammalian hosts. Plasmodium lactate dehydrogenase (LDH) plays a crucial role in the regulation of glycolysis for energy generation of malarial parasites and well known as a potential antimalarial chemotherapeutic. This study aimed to transform and express recombinant lactate dehydrogenase from *Plasmodium falciparum* in *Escherichia coli* BL21(DE3) using recombinant DNA technology. The gene sequence encoding pLDH was purchased from GenScript and cloned into expression vector pET30a(+) with N-terminal and C-terminal Histidine-tag resulted in recombinant plasmid. *E. coli* BL21 (DE3) was transformed with pET30a(+)-pLDH using heat shock method. Then, *E. coli* BL21(DE3)-pET30a(+)-pLDH was cultured in Luria Bertani (LB) broth containing 50 ug/mL kanamycin and was induced by 1mM Isopropyl β -D-1-thiogalactopyranoside (IPTG) at 30°C. Plasmid DNA was isolated and verified by sequencing. Sequence comparison with other available pLDH sequences in Genbank confirmed its identity. Sodium dodecyl-sulfate polyacrylamide gel electrophoresis (SDS-PAGE) analysis showed that recombinant pLDH was expressed with molecular weight approximately 34 kDa. In contrast to induced transformed cells, uninduced transformed failed to express the protein of interest. Recombinant pLDH is expressed in *E. coli* BL21 (DE3) and will further purified for antimalarial drug design and discovery research.

PP1.17 Comparative evaluation of T-Cell response following BNT162b2 and CoronaVac vaccination

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Numerous COVID-19 vaccines have been globally developed, trialled, and administered, with mRNA and inactivated viral vaccines being the predominant choices in Malaysia. However, despite their widespread administration, there is a scarcity of research exploring the cellular immune response triggered by inactivated viral vaccines compared to mRNA or adenoviral-based vaccines. In this study, we conducted a vaccine-specific T-cell



response in individuals receiving mRNA vaccine (BNT162b2) and inactivated viral vaccine (CoronaVac). Peripheral blood mononuclear cells (PBMCs) were isolated from 52 vaccinated individuals at four-time points, i) baseline, ii) three weeks after the first dose, iii) two weeks after the second dose and iv) at 12 months post-initial dose, allowing for the assessment of long-term immune memory. The antigen-specific T-cell response was analysed from isolated PBMCs stimulated with SARS-CoV-2 peptides using enzyme-linked immunospot (ELISpot) assay. Our findings revealed that there was no T-cell reactivity at baseline. However, the T-cell response in individuals vaccinated with BNT162b2 was significantly higher than CoronaVac recipients at all time points studied ($p < 0.05$) (excluding baseline). These results indicated that the BNT162b2 vaccine exhibited greater stability and strength in inducing and sustaining long-term T-cell immunity. Based on these findings, which compared the mRNA vaccine (BNT162b2) to the inactivated viral vaccine (CoronaVac), the mRNA COVID-19 vaccine platform demonstrated superior performance in inducing and sustaining long-term T-cell immunity. Therefore, considering its greater stability and strength in immune response, the mRNA vaccine platform should be considered as the preferred choice for future vaccination programs.

PP1.18 Content of luteolin and luteolin-7-O-glucoside from the leaves of *Vernonia amygdalina* Del., and inhibitory effect on nasopharyngeal carcinoma cells

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Nasopharyngeal carcinoma (NPC) is a cancer that develops from the epithelium of the nasopharynx. Its incidence and mortality rates are highest in Southeast Asia. NPC is treated with radiotherapy and cytotoxic chemotherapeutic drugs. However, treatment-resistance, recurrence and distant metastasis remain challenging; whilst NPC patients have poor survival. There is growing interest in natural products with therapeutic potential to circumvent toxicity associated with synthetic anti-cancer drugs and radiotherapy. *Vernonia amygdalina*, predominantly found in Africa, belongs to the family Asteraceae. Luteolin and luteolin derivatives had been reported to have pharmacological activities, such as antioxidant, antidiabetic and antitumorigenic. This study describes the quantification of luteolin and luteolin-7-O-glucoside in methanol leaf extract of *V. amygdalina* by High-Performance Liquid Chromatography (HPLC) method, followed by bioactivity analyses. Dried powdered leaves were extracted with methanol at 40°C for 6 hours, freeze-dried, then analysed by HPLC. The extract and bioactive compounds were screened for inhibitory effects on NPC cells using MTS assay, then verified using a real-time cell analyser. Flow-cytometry and high content analysis were performed to detect luteolin-induced apoptosis. The amount of luteolin was lesser than luteolin-7-O-glucoside in the extract. Nevertheless, luteolin displayed apparent dose-dependent inhibition of NPC cells as compared to luteolin-7-O-glucoside. Cell growth kinetics concurred with the MTS assay. Nonetheless, flow cytometry and high content analysis showed that luteolin did not induce apoptosis. In summary, luteolin and luteolin-7-O-glucoside were identified in the methanolic extract of *V. amygdalina* leaf. Only the extract and luteolin inhibited the growth of NPC cells.

PP1.19 Correlation of anti-nuclear antibody indirect immunofluorescence titration and pattern in systemic autoimmune rheumatic diseases diagnosis

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Anti-nuclear antibody (ANA) detection is an important laboratory test used to screen for systemic autoimmune rheumatic diseases (SARDs). The indirect immunofluorescence (IIF) method performed on the HEp-2 cells or its derivative is considered as the gold standard. Positive ANA-IIF is reported with end-positive titration and pattern. We conducted this study to determine the correlation between ANA-IIF titration and pattern with the diagnosis

of SARDs. A retrospective study was done whereby the positive ANA-IIF samples from patients aged 18 years old and above were included. ANA-IIF titration and pattern were recorded in all patients. The final diagnosis of SARDs was identified from the patient's clinical chart. We managed to include 179 patients for analysis with majority of the patients were female (79.9%) and from Malay ethnicity (66.5%). In term of titration, the titre of 1:80 had the highest number of patients, N=65 (36.3%) followed by 1:160 titration, N=45 (25.1%). Speckled was the predominant pattern observed, N=90 (50.3%) followed by homogeneous, N=76 (42.5%). The diagnosis of SARDs was made in forty-five patients (25.1%) with majority was diagnose with SLE, N=41. ANA-IIF titre of 1:320 was shown as the best titration to differentiate SARDs versus non-SARDs with sensitivity and specificity of 86.7% and 77.6% respectively. The homogeneous pattern was also significantly associated with SARDs ($p=0.04$). ANA-IIF titration of 1:320 can be used as the cut-off titration in differentiating between SARDs and non-SARDs. Patients with homogeneous pattern were more likely to be diagnosed with SARDs than other ANA-IIF patterns.

PP1.20 Detection of common loss of heterozygosity (LOH) in oral dysplastic and squamous cell carcinoma tissues: a systematic review

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Oral squamous cell carcinoma (OSCC) accounts for more than 90% of oral cancer incidence. Progression of OSCC from oral dysplasia can occur via many molecular changes including loss of heterozygosity (LOH). As oral cancer commonly associated with late diagnosis leading to poor patient survival, detection of early molecular changes such as LOH able to distinguish patients into low- and high-risk groups for transformation to OSCC. There are many studies documenting various chromosomal regions susceptible to LOH changes, however not much is known whether these LOH are common to OSCC and if they are associated with distinct risk factors such as smoking, alcohol and betel quid chewing. This study aimed to summarize the most common chromosomal region associated with progression of oral dysplasia towards OSCC detected by LOH analysis and further determine the common risk factor associated with reported LOH changes. A comprehensive literature search was conducted in PubMed, ScienceDirect and Scopus databases for related articles published between 1994 and 2022. The combined search keywords used are loss of heterozygosity, oral cancer and oral dysplasia. The results identified 51 potentially relevant articles whereby 34 met the inclusion criteria. From these articles, only 11 documented the patients risk factors. The most common chromosomal regions afflicted with LOH are 3p and 9p. while common risk factors associated with LOH changes are smoking and alcohol consumption. Many LOH changes have been reported across different chromosomal regions. Complete profiling of common LOH changes and associated risk factors can be used to predict OSCC progression.

PP1.21 Detection of parasites In Tasik Permaisuri, Cheras Kuala Lumpur using basic laboratory diagnostic techniques

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Waterborne parasites have been reported to cause serious disease in human worldwide at epidemic scale. Urban recreational lake acts as a source of waterborne parasites due to exposure of water-related activities by humans, as reported by few studies. There is no data regarding microbiological organisms in Tasik Permaisuri, Cheras. This study aims to determine the prevalence and most common species of waterborne parasites in this lake. The third objective was to determine the correlation between physical parameters and the presence of parasites in the lake. This is a cross sectional study where water samples were collected 4 times from 8 stations



in sterile plastic bottles from Tasik Permaisuri. 10 litres of water were collected per station from 2 points: surface water and deep water. Samples were then filtered for the detection of parasites using a nitrocellulose membrane. Physical parameters were measured in situ using multi-probe parameter. 31.25% of the samples were positive. The commonest species found were free living amoeba (43%), *Entamoeba complex* (25%), *Giardia spp.* (10.3%) and Hookworm spp. (6%). Surface water have the highest contamination of parasites. Parameters with positive Pearson's correlation coefficient were pH and turbidity, while dissolved oxygen were negatively correlated. The prevalence of parasites was lower compared to other studies, but several pathogenic waterborne parasites were clearly visualized in the samples. Immediate action should be taken which includes limiting water-based activity around this area and public awareness should be created to ensure visitors take precaution when using the lake.

PP1.22 Development of plasma amino acids analysis using reversed phase high performance liquid chromatography (RP-HPLC) with fluorescence detector for diagnosis of amino acid disorders

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Amino acid disorders are a major group of inborn errors of metabolism (IEM) with variable clinical presentations. Plasma amino acids previously analysed by ion-exchange chromatography (IEC), a reproducible but time-consuming method. Our laboratory had set up and validated a new method as an alternative for IEC which takes advantage of automated sample derivatization. Performance evaluation of amino acids analysis was done using RP-HPLC. We then analysed 2525 plasma specimens obtained from patients with clinical suspicion of amino acid disorders. Clinical data from patients with confirmed diagnosis of amino acid disorders were obtained, analysed, and compared. Samples were deproteinised and analysed using Agilent HPLC system with reverse-phase C18 column and derivatised automatically by the system. Repeatability showed good precision with coefficient variation (CV) ranged from 0.43% to 3.45% and CV for robustness ranged from 3.45%-16.04%. All amino acids showed good linearity with correlation coefficient (R^2) were in the range 0.97-0.99. Recovery for internal standard (Norvaline) was between 100.25%-101.24% which is considered acceptable. This method has shown a significantly good correlation with the IEC with Spearman's rho (R_2) in the range 0.75-0.99. We were able to diagnose five patients with amino acid disorders. We had detected 2 cases (40%) with Citrullinemia Type 1, 2 cases (40%) with Citrullinemia Type 2 and 1 case (20%) with Tyrosinemia Type 1. This data indicates that amino acid analysis by RP-HPLC could also diagnose several amino acid disorders in the high-risk patients and may serve as alternative method for amino acid quantitation in diagnostic laboratory.

PP1.23 Diagnostic accuracy of rapid SARS-CoV-2 PCR compared to reverse transcription polymerase chain reaction (RT-PCR)

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Malaysia had reached 5 million COVID-19 cases as of May 2023. Perak alone recorded 238,369 cases with 2,141 deaths. Due to the capability of producing results within 1-2 hours, rapid SARS-CoV-2 PCR (rapid PCR) is used to hasten case detection, hence improving the diagnosis and management of COVID-19 patients. This study aims to determine the diagnostic accuracy of rapid PCR using reverse transcription polymerase chain reaction (RT-PCR) test as a reference standard. Data was retrieved from Sistem Informasi Maklumat Kesihatan Awam (SIMKA) for Perak State in 2021. Only patients receiving both rapid PCR and RT-PCR tests were selected in this study. The

selection was made regardless of the purpose of testing; critically ill patients, urgent transplant cases, brought-in-dead (BID) cases or other cases upon consultation. Statistical analysis was carried out using SPSS version 23. From a total of 130 cases selected, 40 showed inconclusive results and were excluded from the analysis. The majority were Malays (63%), followed by Chinese (22%) and Indians (15%), males (56%) and a mean age of 51.4±18.9. A sensitivity of 92.3% (95% CI: 70.3-99.5), specificity of 94.8% (95% CI: 88.3-98.4), PPV of 75.0% (95% CI: 51.1-91.5) and NPV of 98.6% (95% CI: 94.2-99.9) were reported. The overall accuracy of 94.4% (95% CI: 87.5-98.2) was calculated. This study demonstrates that rapid PCR performance is consistent with RT-PCR.

PP1.24 Effect of different stabilisers on the formulation characteristic of standardised *Eurycoma longifolia* root water extract loaded niosome and its cytotoxicity

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Niosomes is a nonionic surfactant vesicle considered as potential drug delivery system which can improve the stability and bioavailability of the standardised *Eurycoma longifolia* root water extract to the targeted cell. Stabiliser is an important component in the niosome formulation and may eventually affect the formulation's outcome. This research aimed to prepare standardised *E. longifolia* root water extract loaded niosome using different stabilisers and evaluate its cytotoxicity activity against several cell lines. Niosomes were prepared using heating and sonication method. Three different stabilisers (sodium dodecyl sulphate, phenonip and alpha-tocopherol) were used to prepare the niosome formulation. The prepared niosomes were assessed for their physicochemical characteristics including diameter size, polydispersity, and stability. An in vitro cytotoxicity assay on the optimised niosomes against green monkey kidney, murine macrophage and human leukemia monocyte cell lines were evaluated. Addition of sodium dodecyl sulphate to the formulation showed lowest niosome diameter size (195.6 nM) compared to alpha-tocopherol (221.5 nM) and phenonip (493.0 nM). There was no physical appearance change on all three optimised niosomes formulation after pressure stability test. Incorporation of alpha-tocopherol to the niosome formulation caused less growth inhibition to all three cell lines tested compared to other stabilisers. Overall, these results indicated that niosome formulation containing alpha-tocopherol stabiliser is the optimal formulation with characteristic diameter size 221.5, polydispersity index value 0.05 and low toxicity to all cell lines. This study suggests standardised *E. longifolia* root water extract loaded niosome formulation was successfully developed and can be further used in the in vitro biological efficacy study.

PP1.25 Elucidation of anti-viral effect from the composition of *Schizophyllum commune* against dengue: a computational approach

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Dengue is a most important mosquito borne viral disease. Dengue haemorrhagic fever and dengue shock syndrome is considered to correlate directly with higher titres of viremia. Therefore, the need for new antiviral agents is imperative for early treatment to prevent manifestation of severe dengue. Extract from *Schizophyllum commune*, a mushroom kind fungus had demonstrated some level of protection during dengue virus infection where marked reduction in the expression levels of ENV and NS5 genes in in vitro testing. It is postulated that beta-glucan, the major compound that resides at the cell wall of *S. Commune* might play its role as an antiviral agent against DENV. The goal of this project is to understand how beta-glucan act against DENV by using computational approach. Molecular modelling assessed the attribute for beta-glucan from *S. Commune* to



uncover the antiviral mechanism towards non-structural dengue protein structures (NS1, NS2B/NS3 protease, NS3 helicase, NS5 methyl-transferase and RdRp) in DENV. The results of this work provide important insights for the understanding of the antiviral mechanism of beta-glucan from *S. Commune*. Molecular docking analyses with NS5 methyltransferase showed β -1,3 glucan has a high binding affinity (-7.18 Kcal/mol) for NS5 Methyltransferase. In comparison to other molecular docking of non-structural dengue protein structures, this study has revealed that β -1,3 glucan has a higher binding affinity for this NS5 methyltransferase. Thus, this ligand may inhibit the replication process of the viral and suppressed the NS5 gene expression which correlate with the *in vitro* studies.

PP1.26 Epidemiological analysis using pulsed-field gel electrophoresis of *Salmonella typhi* outbreak in Kelantan prison

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Salmonella typhi is the etiological agent of typhoid fever, a systemic febrile illness in humans. The disease remains an important public health problem in Malaysia and highly endemic in Kelantan with incidence rate of 0.26 and mortality rate of 0.05 per 100,000 populations in 2021. The objective of this study is to investigate the genetic diversity and relatedness of typhoid outbreak among foreigner prisoners in Penjara Pengkalan Chepa in 2022. A total of 27 suspected outbreak *Typhi* isolates were processed. Antibigram of the isolates were determined for ampicillin (10 μ g), chloramphenicol (30 μ g), trimethoprim-sulfamethoxazole (25 μ g), nalidixic acid (30 μ g), ceftriaxone (30 μ g) and ciprofloxacin (5 μ g) using Kirby-Bauer disk diffusion method. Ten isolates were subjected to Pulsed-Field Gel Electrophoresis (PFGE) using *Xba*I restriction enzyme. PFGE results were analysed by bioinformatic software (FPQuest). Cluster analysis of the Dice similarity co-efficient was based on the unweighted pair group method with arithmetic averages (UPGMA) and dendrogram was generated to describe the relationship among isolates. All isolates were found to be resistant to only ciprofloxacin. Cluster analysis based on a Dice Coefficient of 0.5 and a similarity index of 90% showed a cluster of similar PFGE pattern with 13 to 15 DNA fragments with size ranging from 30 kb to 600 kb. In conclusion, PFGE results showed that majority isolates were homogenous and genetically related. PFGE is still appropriate for the investigation of local outbreak and served successfully as the first line tool in the outbreak identification. However, further study using whole genome sequencing is required as it can provide full genetic information of the outbreak strains.

PP1.27 Establishment of urine pterins reference value as a biomarker for inborn error of tetrahydrobiopterin (BH4) metabolism in Malaysian infant

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Inborn errors of metabolism (IEM) of tetrahydrobiopterin (BH4) represent a rare group of inherited neurotransmitter disorders that manifests mainly in infancy or childhood with developmental delay, neuroregression, epilepsy, movement disorders, and autonomic symptoms. Patients with hyperphenylalaninemia should be screened for this disorder to prevent delayed diagnosis. The analysis of pterins in urine samples is essential for the early diagnosis of neurotransmission defects in the paediatric age. We are currently adopting reference ranges for urinary pterin metabolites from other countries' populations. The reference range of our population needs to be established as there is a possible significant difference between the Caucasian and Asian populations. Thus, our aim was to standardize previously reported HPLC procedures for the analysis of pterins and to establish reference values for

our Malaysian local population. Samples from 128 normal subjects from the age range of 1 to 12 months old were analysed by High Performance Liquid Chromatography (HPLC) with fluorescence detection. Chromatographic separation of pterins analytes was accomplished in 12 min for each sample. The statistical analysis reveals that there is a significant difference (p -value <0.05) between the newly established mean of both Neopterin and Biopterin; 1.95 and 1.29 with the existing mean values 2.55 and 1.75 respectively. In conclusion, we have successfully developed urinary pterins analysis by using HPLC and established a reference interval of our local population to ensure reliable and accurate diagnoses of BH4 disorders.

PP1.28 Evaluation of carbohydrate-fat ratio in Zucker Atherogenic rats: A1H Nuclear Magnetic Resonance (NMR) metabolomics approach

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The development of metabolic syndrome (MetS) relies on a complex interaction between genetic determinants and environmental factors such as dietary patterns. We explored plasma metabolic responses to different carbohydrate-fat ratios using 1H Nuclear Magnetic Resonance (NMR) metabolomics in Zucker atherogenic rats. Zucker Atherogenic rats ($n=24$) were given a standard animal diet (65% Carbohydrate, 11% Fat, 24% Protein), Diet A (54% Carbohydrate, 32% Fat, 14% Protein), Diet B (49% Carbohydrate, 37% Fat, 14% Protein) and simvastatin (10 mg/kg). An additional three lean Zucker rats were given each Diet A and Diet B. The treatment was completed at eight weeks. Plasma samples were subjected to metabolomics analysis using 600 MHz NMR in tandem with multivariate data analysis (MVDA). In the simvastatin group, 33 metabolites were upregulated and seven were downregulated. Diet A group showed 36 metabolites to be downregulated while four were upregulated. Rats in the Diet B group indicated 35 metabolites were downregulated and five were upregulated. Reduction of choline, isoleucine, lactate, and leucine were observed in Diet A, Diet B and simvastatin compared to the control group ($p<0.05$). Decreasing choline, isoleucine, lactate, and leucine levels may be postulated with a reduction in cardiovascular risk. Pyruvate metabolism, gluconeogenesis, taurine metabolism, hypotaurine, glycine, serine, threonine, and histidine metabolism were among the groups' most impactful and significant pathways. Our results demonstrated that metabolomics utilization can be used to explore the changes in metabolism attributed to different carbohydrate-fat ratio intake.

PP1.29 Exploration of lipid profiling in Malaysian with first-onset myocardial infarction through the lipidomic approach

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Lipidomics is the study of cellular lipid species and their stereo-electronic interactions with neighbouring lipids and



proteins. In a healthy setting, lipidomics is used to describe the specific lipids involved in dynamic physiological lipid changes, providing further insight into lipid control in cellular biology. Clinical lipidomics investigates the correlation and regulation between a large scale of lipid elements measured with clinical phenotypes. Samples from the case-control study of Malaysia Acute Vascular Event Risk Study (MAVERIK) are analysed for both untargeted and targeted lipidomics approaches. In the untargeted lipidomics study, more than 400 lipid species were analysed using direct infusion liquid chromatography-mass spectrometry. This method explored each lipid class enabling it to summarise the biological variation of lipid profiling in different ethnicity in Malaysia and outline lipid classes and species associated with myocardial infarction (MI) risk. Thus, providing a guide for further detailed quantification in our targeted approach. The targeted lipidomics approach explores approximately 50 lipids species such as phosphatidylcholines, triacylglycerols, and sphingomyelins in the same MAVERIK population. We are currently using the WATERS ultra-performance liquid chromatography (UPLC) separation system in combination with Triple Quadrupole-Mass Spectrometry (QQQ-MS). Our high-throughput method is optimised for evaluating cardiometabolic risks in the Malaysian population and analysis at our facility. With the findings of this study, we expect to identify lipid biomarkers for potential use in therapeutics and the development of integrated omics risk prediction scores.

PP1.31 Genetic profiling of *Brugia malayi* infections in Malaysia: utilization of COX1 gene

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Brugia malayi is one of the parasitic nematodes which cause lymphatic filariasis (a.k.a Untut) in Malaysia. Despite its wide distribution, little is known about this species genetic variability and molecular epidemiology due to lack of reliable markers for this respective species. The present study aims to assess the utilization of the Cytochrome oxidase subunit 1 mitochondrial gene (COX1) as a marker to determine inter and intra-species variation within *Brugia malayi*. Genomic DNA from 14 microfilaria-positive human blood samples obtained from selected localities in Sabah, Sarawak, and Pahang during the surveillance program was extracted and amplified using a primer specific for the *Brugia malayi* COX1 gene. Multiple sequence alignment and phylogenetic analysis of COX1 sequence for regional *Brugia malayi* isolates showed no apparent differentiation that could be attributed to their geographical origin. However, COX1 gene analysis showed it possible to differentiate the *Brugia malayi* isolates into two types: human and canine, based on the location of C/T SNPs at 2511, 2514 and 3130. The phylogenetic tree analysis method showed a similar topology with two distinct human and canine clusters. The findings of this study suggest COX 1 gene is a reliable tool for distinguishing human *Brugia malayi* from canine *Brugia malayi*. However, the analysis using other markers, such as the Internal Transcribe spacer (ITS), as a complementary tool would be beneficial to differentiate the isolates based on their geographical origin.

PP1.33 Identification and genetic relatedness of *Cladosporium* species isolated from indoor air of hospitals environment

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Phenotypic method is the gold standard for species identification of *Cladosporium*. However, molecular

identification using DNA barcoding marker is more reliable compares to the gold standard method. NCBI-BLAST search for DNA barcoding sometimes is tricky and results imprecise identification. Thus, in this study we evaluated the significance of phylogenetic tree in facilitating species identification and genetic relatedness among the strains of *Cladosporium*. A total of 120 strains of *Cladosporium* species were isolated from indoor air of four Malaysian hospitals. The *Cladosporium* DNA sequences of ITS regions in the rRNA were aligned and trimmed in MEGA7 software. In the same software, the ITS sequences were analysed using a sequence evolution model, Maximum Likelihood Tree with 1000 replication, to construct a phylogeny. A total of 16 clades were recognized from the phylogenetic tree constructed. The 120 strains of *Cladosporium* strains were grouped into two main clades (I and II), in which the Clade I and II contained six and ten subclades, respectively. A total of 114 strains were successfully identified into six species (*C. tenuissimum*, *C. xantochromaticum*, *C. exasperatum*, *C. sphaerospermum*, *C. lebrasiae* and *C. halotolerans*). However, six strains were separated into two subclades with unknown species identification. Strains of *C. tenuissimum*, *C. xantochromaticum* and *C. exasperatum* are closely related and grouped in Clade I, while strains of *C. sphaerospermum*, *C. lebrasiae* and *C. halotolerans* are closely related and grouped in Clade II. The outcome of this study demonstrated the usefulness phylogenetic analysis to differentiate the various species of *Cladosporium* and evaluated their genetic relatedness.

PP1.34 Molecular identification of *Aspergillus spp.* isolated from indoor hospitals environment in Peninsular Malaysia

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Fungi are ubiquitous in indoor environments and play important role in wide range of diseases to human especially in immunosuppressed patients. Indoor air quality in hospitals is important to prevent nosocomial infection among the patients and healthcare workers. Morphological characterization is the gold standard method used to identify *Aspergillus spp.* However, molecular identification using DNA sequencing is more reliable compared to morphological characteristics methods. Misidentification may occur due to variability and overlapping characters, particularly for closely related species. Thus, this study was carried out to evaluate the significance of molecular identification using PCR amplification of Internal transcribed Spacer (ITS) region and phylogenetic analysis. The present study showed molecular identification using nucleotide sequences of ITS region identified 15 species of 91 isolates of *Aspergillus spp.* Phylogenetic analysis based on Maximum Likelihood (ML) tree with 1000 replication showed the tree was divided into two main clades (I and II). From the tree, all the isolates from same species were grouped together in the same clade. Main clade I has five subclades (*A. versicolor*, *A. sydowii*, *A. unguis*, *A. spelunceus*, *Aspergillus* section Usti) while main clade II has 10 subclades (*A. ochraceopetaliformis*, *A. flavus*, *A. assiutensis*, *A. petersonii*, *A. hiratsukae*, *A. fumigatus*, *A. stromatoides*, *A. chevalieri*, *A. tubingensis* and *A. niger*). For some *Aspergillus spp.*, the ITS region shows little or no variation between closely related species due to insufficient nucleotide differences. Therefore, the use of other genes such as β -tubulin and calmodulin genes or employing Next Gene Sequencing (NGS) are recommended for better species identification.

PP1.35 Comparative leaf anatomy of *Prismatomeris glabra* (Korth.) Valetton and *P. tetrandra* (Roxb.) K. Schum subsp. *malayana* (Ridley) J.T.J. in Peninsular Malaysia

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Comparative leaf anatomy study was conducted on two species of *Prismatomeris* from Peninsular Malaysia, namely *P. glabra* (Korth.) Valetton and *P. tetrandra* (Roxb.) K. Schum subsp. *malayana* (Ridley) J.T.Johanss, both are known as *tongkat haji samad*. *Prismatomeris glabra* was used traditionally for wellness, enhancing stamina and aphrodisiac. *Prismatomeris tetrandra* was used to treat gum bleeding, wounds, hepatitis, and anemia. The objective of this study is to use leaf anatomical features to distinguish between these two species to verify the correct species used in medical practice, especially in powder form, since the raw materials for herbal preparations typically come in powder form. Observations under a scanning electron microscope include epidermal gold coating and critical point drying. Observation of the raw plant materials under a light microscope, involved macerating and bleaching with chloral hydrate. Fully developed plant leaves were used as samples. The results of this study have demonstrated that these two species have some common characters but can be distinguished by some anatomical characteristics. *Prismatomeris tentandra* subsp. *malayana* has tetracytic and paracytic stomata and solitary crystals; *P. glabra* exclusively has paracytic stomata. The anticlinal walls and periclinal walls are raised and sunken in *P. tetrandra* subsp. *malayana*'s, granule-type wax and crust present. Contrary to *P. glabra*, which has obscure anticlinal and periclinal walls, the abaxial epidermis of this species has densely packed cuticle striae that encircle the stoma, crustose type wax, and granules. The results of this study clearly show that the anatomical characteristics can be used to distinguish these two *Prismatomeris* species studied.

PP1.35 Comparative leaf anatomy of *Prismatomeris glabra* (Korth.) Valetton and *P. tetrandra* (Roxb.) K. Schum subsp. *malayana* (Ridley) J.T.J. in Peninsular Malaysia

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PP1.36 Improved processing techniques approach in electron microscopy examination for imaging medical renal biopsies at local setting Malaysia

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In recent years in Malaysia, medical renal biopsies have increased in frequency in nephrotic syndrome, both native cases and allograft biopsies. Electron microscopy (EM) is important in the diagnosis of renal disease along with routine light microscopy and immunofluorescence and/or immunohistochemistry (IHC) to complete an accurate diagnosis. However, EM services for renal biopsies are still limited due to their cost, lack of expertise in handling EM and labour intensive especially in our healthcare system. Therefore, this study aimed to develop improved techniques in renal biopsy processing for EM to evaluate the images in more convenient settings. Standard processing takes up to 3 days; we proposed to shorten the time period and use EM-zero in en-bloc staining to enhance and get better contrast in imaging the renal biopsy section. We developed post staining using modified Reynold's stain to reduce the lead carbonate precipitates and artifacts under TEM imaging and improve the accuracy particularly in detecting electron-dense items for diagnosis. Rapid method processing has proven the time consumed is reduced to 2 days. The improved techniques images shown better resolution, sharpness, and focal for our local settings. The contrast is greatly enhanced in detecting and differentiating the electron-dense granules. This study presents improved techniques for processing renal biopsies for electron microscopy imaging. Identifying specific ultrastructures and electron-dense granule that are present plays an important role in the diagnosis and shows that EM remains an important component of the diagnostic evaluation of medical renal biopsies.

PP1.37 *In silico* enrichment analysis based on GWAS genetic variants reported in patients with gout

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Gout pathogenesis is complex and unclear. With the advent of technology, enrichment analysis has been shown to be a useful approach to elucidate the disease pathogenesis, including gout. In this present study, we performed *in silico* enrichment analysis using the published gout-associated single nucleotide polymorphisms (SNPs) to identify the enriched gene ontology and pathway that involved in the pathogenesis of gout. We retrieved the reported gout-associated genetic variants from the public data repository, National Human Genome Research Institute (NHGRI) European Bioinformatics Institute (EBI) catalogue of published GWAS. Using the retrieved genetic variants, pathway analyses were performed using the Kyoto Encyclopedia of Genes and Genomes (KEGG) database with default settings, followed by gene ontology analysis to explore the biological processes, cellular components, and molecular functions. A total of 38 gout-associated SNPs were retrieved and were annotated to 36 unique genes. Gene ontology analysis demonstrated significant enrichment for biological process, i.e. *urate metabolic process* (FDR:1.9×10⁻⁰⁵) and *urate transport* (FDR:5.2×10⁻¹⁵); and cellular component, i.e. *apical plasma membrane* (FDR:5.7×10⁻⁰⁴). Further pathway analysis demonstrated that three of the 36 unique genes showed a significant enrichment for the KEGG pathway, *ECM-receptor interaction* (q-value:0.013). Findings from this present study reaffirm the potential of *in silico* analysis using the reported gout-associated gene list to perform enrichment analysis to gain mechanistic insight into the gene list. Furthermore, these findings serve as important information for future functional study as well as the development of potential therapeutic agents in the management of gout disease.



PP1.38 Novel synthetic quinazoline-benzamide derivatives as potential therapy for non-small cell lung cancer

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Bronchus, lung, and trachea are the third most common sites of cancer among Malaysians. The 5-year relative survival rate of bronchus, lung and trachea cancer patients in Malaysia is 11%. Non-Small Cell Lung Cancer (NSCLC) represents approximately 80% of all lung cancers. NSCLC cells frequently express epidermal growth factor receptor (EGFR), generally associated with cancer development and progression. Mutation in EGFR confers sensitivity to EGFR tyrosine kinase inhibitor, for example Gefitinib. EGFR mutations are detected in 39.5% of NSCLC cases in Malaysia. Unfortunately, current EGFR inhibitors in NSCLC treatment are facing resistance due to emergence of EGFR mutations. Consequently, patients with resistance to current EGFR inhibitors have limited treatment options. Therefore, new strategies for overcoming resistance are needed for lung cancer treatment. In this project, a series of quinazoline-benzamide derivatives was synthesized to inhibit A549 (wild-type EGFR) and H1975 (L858R+T790M EGFR mutations) NSCLC cells. Screening of quinazoline-benzamide derivatives for anti-proliferative activity using MTT assay highlighted the most potent derivative, E20 (IC₅₀ in A549: 29.8 μM; H1975: 14.3 μM), as compared to the positive control, Gefitinib (IC₅₀ in A549: 34.0 μM; H1975: 18.8 μM). Apoptosis-inducing activity of E20 was evaluated against H1975, selected as a cell with EGFR mutations model for NSCLC, by flow cytometry and fluorescence microscopy. Within 24 hours of treatment, 50 μM E20 induced >70% apoptosis. Fluorescence imaging showed increased propidium iodide-stained cells, which concurred with apoptosis. Our findings suggest that E20 has treatment potential and can be further studied as an EGFR inhibitor in lung cancer.

PP1.40 Management of polypharmacy among haemodialysis subjects

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Polypharmacy is one of the major common issues among haemodialysis patients. It is associated with increased hospital admissions, morbidity, mortality, and expenditures. There is a lack of data on the management of polypharmacy in our setting. Hence, this study aims to determine the management of polypharmacy among stage 5-End Stage Renal Disease (ESRD) patients undergoing haemodialysis. In this preliminary cross-sectional study, 102 subjects were recruited from the outpatient at Centre of Excellence Haemodialysis, Taman Batu Muda, Malaysia. The data were recorded from the patients' medical record and tabulated. The demographic characteristics of the subjects were presented using percentage. The study included 102 participants (49 male, 53 female). The prevalence of polypharmacy was 26.47% among the ESRD subjects. The mean age of the subjects was 54.26±13.85 and the dry weight was 65.88±14.57. Among all the three ethnics, Malay was higher (94.1%) compared to the other ethnics. Most of the subjects were married (77.5%) followed by single (16.7%) status. The top five common drugs were taken by the subjects were Calcitriol (37.3%) followed by Atorvastatin (32.4%), Felodipine (27.5%), Frusemide (24.5%), and Simvastatin (24.5%). A combination of 4 drug (25.5%) were mostly consumed by the ESRD subjects undergoing haemodialysis followed by 3 (22.5%), 5 (16.68%), 2 (16.68%), 1 (9.80%), 6 (5.89%) and 7 (2.95%). Polypharmacy is highly prevalent among the haemodialysis subjects. A review of the medications prescribed to the haemodialysis patients must be reduced. In addition, this study needs further analysis on drug adverse effects and complementary medicine among haemodialysis subjects.

PP1.42 Mucosal immune response following completed vaccination of mRNA-based, whole inactivated and viral vector COVID-19 vaccines in Malaysia

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SARS-CoV-2, the causative agent of COVID-19, is responsible for significant morbidity and mortality rates globally. Various vaccine platforms have been deployed, including mRNA-based (Pfizer-BioNTech), whole inactivated virus (Sinovac) and viral vector (AstraZeneca) technologies. Assessing salivary immunoglobulin A (IgA) as a measure of mucosal immunity not only provides insights into post-immunization antibody responses but also offers a cost-effective and non-invasive tool for disease management. In this study, we detected IgA against SARS-CoV-2 S1 spike antigen in saliva samples using enzyme-linked immunosorbent assay (ELISA) at baseline, 3 weeks after the first dose and 2 weeks after the second dose of Pfizer, Sinovac or AstraZeneca vaccine administration. After the first dose, 95% (21/22), 62% (13/21), and 53% (8/15) of the tested samples were positive in Pfizer, Sinovac and AstraZeneca recipients, correspondingly. After the second dose, 100% of all vaccine recipients were positive for salivary IgA. Pfizer, Sinovac and AstraZeneca induced a significantly higher ($p < 0.005$) median salivary IgA optical density ratio of 4.0 (interquartile range (IQR); 2.8-5.2), 2.1 (IQR; 1.7-2.3) and 1.8 (IQR; 1.5-2.3) after two vaccine doses compared to after the first vaccine dose with a median of 1.9 (IQR, 1.3-2.5), 1.4 (IQR; 0.9-1.7) and 1.1 (IQR; 1.0-1.3), respectively. In conclusion, all three vaccines studied were able to elicit a mucosal immune response characterized by elevated salivary IgA level following the second dose. These findings contribute to our understanding of the immune response produced by different COVID-19 vaccine platforms and emphasize the importance of assessing mucosal immunity in addition to adaptive immune response.

PP1.43 Optimal condition for hydrogen peroxide to induce senescence in human lung fibroblast cells

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Human lung fibroblast cells (WI-38) reach senescence and lose their replicative capability after a certain number of population doublings, which usually takes a longer time. Hydrogen peroxide has an oxidative stress property that induces premature senescence within a short period of time. Senescence beta-galactosidase is one of the biomarkers that can be used to identify induced premature senescent cells. The purpose of this experiment is to establish the optimal hydrogen peroxide concentration and time interval for senescence induction in human lung fibroblast cells. The cells were seeded for 24 hours in the 96-well plates and then exposed to a series of hydrogen peroxide concentrations (1.56, 3.125, 6.25, 12.5, 25, 50, 100, 200, and 400 μ M) for a period of 3 and 7 days. Doxorubicin was used as a positive control. Senescence-Associated beta-galactosidase (SA- β -gal) activity was observed on days 3 and 7 using Senescence β -Galactosidase Activity Assay Kit. It showed that the percentage of galactosidase activity did not exceed more than 20% after 3 days of treatment with hydrogen peroxide. However, after 7 days of treatment, the percentage of galactosidase activities increased by more than 80%, with the concentrations range from highest to lowest is 6.25 > 12.5 > 3.125 > 100 > 25 μ M. In conclusion, the optimal condition to induce senescence in human lung fibroblast cells for hydrogen peroxide was galactosidase activity percentage at 153% at a concentration of 6.25 μ M after 7 days of treatment. This *in vitro* hydrogen peroxide-induced senescence model can be used in pre-clinical anti-aging drug discovery study.



PP1.44 Aedes surveillance in different types of residential in dengue endemic areas in Selangor

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Dengue was recognized to be the fastest spreading vector-borne viral disease in the globe and is endemic in over 100 countries. In Malaysia, dengue cases are concentrated in urban area, and it was recognised that dengue is transmitted by *Aedes* mosquito. The present study determined *Aedes* density and species distribution in 9 pre-selected dengue endemic sites via ovitraps surveillance. The sites were categorised according to the types of residential which were well-planned and unplanned landed houses, or namely known as Taman and Kampung, as well as high-rise residential building or known as Pangsapuri. A total of 60 ovitraps were placed in each site for 5 days before being collected for laboratory identification of larvae according to their species. The ovitrapping activities were aided with PesTrapp®, a digital and technology innovation that assists in managing the ovitraps data in the field and in the laboratory. The number of identified larvae was recorded based on the species and immediate analysis of the Ovitrap Index (OI) and the mean number of larvae (MNL) were obtained. Comparison among three different types of residential indicated that no significant differences of OI, recorded with more than 10% threshold, indicating high *Aedes* density. Whilst, for *Aedes* distribution, the *Ae. aegypti* is predominant indoors and *Ae. albopictus* mosquito is predominant outdoors. In conclusion, high dengue density was observed in all types of residential with *Ae. aegypti* remains dominant indoor. In addition, the incorporation of PesTrapp improve the entomological work process enabling rapid data collection and analysis.

PP1.45 Parasites from dogs and cats around the Kinta Valley – is there a need for awareness among pet owners on the zoonotic potential?

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Over the years from 2010 to 2018, samples such as whole parasites, skin scrapings, blood, faecal samples as well as organ samples from pet animals such as dogs and cats, from around the Kinta area in Perak, were submitted to diagnose any parasitic infections present. It was found that an average of 35% of cat samples and 24% of dog samples were found to have parasites. These include helminth eggs such as *Ancylostoma* sp., *Toxocara* sp., *Trichuris* and *Strongyloides* as well as protozoans such as *Babesia*, *Ehrlichia*, *Hepatozoon* and *Toxoplasma*. Ectoparasites such as *Rhipicephalus*, *Demodex* and *Sarcoptes* were also noted. Faecal samples were screened microscopically by floatation method using a saturated sodium chloride solution to identify helminth eggs. Blood samples were subjected to thin blood smear examination and buffy coat examination. Skin scrapings and tick specimens were examined microscopically and identified according to keys. Organ samples were examined by impression smear to detect blood protozoa in the tissues. Dogs and cats can pick up worms and skin infections from the environment as well as from other animals. The most common skin infections such as *Sarcoptes* mite scabies as well as *Toxocara* worm infections can infect humans. Hookworms caused by *Ancylostoma* larvae can burrow into our skin and cause irritation and itching, if we walk in contaminated areas with bare feet, like the playground or beach. This information is important to pet owners so that the necessary precautions are practised to prevent zoonotic infections among the pet owners and the residing community.

PP1.46 Postprandial glucose lowering effects of sago (*Metroxylon sago Rottb*) in high fat diet-induced diabetic Goto Kakizaki Rat

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Resistant starch (RS) with low glycemic index properties has been shown to be beneficial in terms of managing postprandial hyperglycemia. However, RS extracted from Sago Sarawak remains to be underutilised and the antidiabetic potential has not been extensively studied. To identify the effects of postprandial glucose in response to Sago native (RS2) in severe diabetic rats. The rats were randomly assigned to four groups in individual cages (n=5). Group 1: Pellet + water; Group 2: Pellet + sago RS2 (0.4 g/kg of b.w); Group 3: 50% Pellet + 50% High Fat Diet + water; Group 4: 50% Pellet + 50% High Fat Diet+ sago RS2 (0.4 g/kg of b.w). Several parameters such as general behaviour, body weight changes, food and water consumption were recorded throughout the 3-month study period. Oral glucose tolerance test was done before and after treatment. The treated pancreatic islets were isolated ex-vivo using Collagenase Digestion method and the insulin content was measured using *enzyme-linked immunosorbent assay* (ELISA). The area under the glucose curve showed Sago-RS2 treated group were significantly lower as compared to the control groups in rats receiving both pellet and pellet + 50% HFD diet groups. The insulin content measured from the isolated pancreatic islets were higher in the Sago RS2-treated group. Sago RS2 demonstrated a significant effect in controlling blood glucose in severe diabetic rats receiving high fat diet. This might be triggered mainly by insulin stimulatory effects from pancreatic islets carried out ex-vivo. The postprandial glucose excursion in people with diabetes can be elevated and prolonged, therefore consuming RS2 may help in diabetes management.

PP1.47 Preliminary investigation of anthelmintic activity of cow urine on helminths isolated from rural soil

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It is estimated that 1.3 to 2 billion people in the world suffer from helminth infections. There is evidence through various reports indicating the resistance of human helminths towards anthelmintic drugs. There is ample research concerning the cure of helminth infection, but only a few are focusing on the abolishment of helminth eggs. Over the past few years, there has been an abundance of research associated with cow urine treatment and its properties. Therefore, the aim of this study is to investigate cow urine as an anthelmintic for human helminth eggs isolated from contaminated soil. The cow urine was obtained from a cow farm in Lanchang, Pahang. Next, helminth eggs like *Ascaris lumbricoides* and *Trichuris trichiura* were isolated from rural soil using floatation techniques. The isolated eggs with different quantities of eggs were exposed to either raw cow urine or evaporated filtered cow urine. Results indicated a distinct change in *Ascaris lumbricoides* egg structures after being exposed to evaporated filtered cow urine for a period of time. The egg distortions indicated cow urine had some effect in the uterine layer of the *Ascaris lumbricoides* egg. Although various test has been done using different type of cow urine, evaporated filtered cow urine shows a prominent result compared to raw cow urine. Through this preliminary study, it has proven that cow urine has some anti-helminthic properties against *Ascaris lumbricoides* eggs. However, cow urine compositions can be influence by their environment, dietary intake, time during the urine were taken and the breed. Therefore, further extensive studies are needed to justify this finding.



PP1.48 Prevalence and antifungal susceptibility of *Candida tropicalis* isolated from blood: a 3-year results from Malaysian hospitals

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Candidaemia by all *Candida* species isolated from blood is the most common invasive fungal infection in hospitalized patients and is associated with a high mortality rate. In Asia, the incidence was 1.22 episodes per 1000 discharges and varied among the countries. A total of 622 blood isolates in 2018-2020 from thirty-nine Malaysian hospitals were analyzed. *Candida tropicalis* was the most frequently isolated (33%), followed by *Candida albicans* (25%), pathogenic *Nakaseomyces* spp. (formerly known as *Candida glabrata* complex, 23%) and *Candida parapsilosis* complex (19%). The antifungal susceptibility testing (AFST) analysis was performed using the WHONET 2019 software. The minimum inhibitory concentration (MIC) values were determined by using the E-test method, Sensititre YeastOne™ or Vitek 2 System. The Clinical breakpoints and epidemiological cut-off values are based on MICs outlined by the CLSI. The AFST testing showed that *Candida tropicalis*, susceptibility to echinocandins is 98.8% for anidulafungin, 100% for micafungin, and 40.3% for caspofungin, while 77% of them are susceptible to fluconazole and 72.9% to voriconazole. This analysis showed that there is a shift of *Candida tropicalis* fungaemia which is often found in intensive care unit patients, mainly in those with malignancies, undergoing prolonged catheterization or receiving broad-spectrum antibiotics. Thus, to prevent candidemia in the hospital, focus should be mainly on infection control measures directed towards prevention of catheter-related bloodstream infections and consider antifungal prophylaxis in certain populations of surgical patients.

PP1.49 Production and reactivity analysis of recombinant expressed *Borrelia afzelii* outer surface protein A (OspA)

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Borrelia outer surface protein A (OspA) is highly expressed in bacterial-infected ticks. Moreover, this protein biomarker has been used not only as a target for diagnosing early stages of Lyme disease but also in the vaccine development for blocking bacterial transmission from ticks to humans. Microscopy and Polymerase Chain Reactions (PCR) are two methods commonly used to detect the specific *Borrelia*-causing Lyme disease. Unfortunately, these methods are time-consuming and less sensitive. Thus, this study aims to produce recombinant OspA protein of *Borrelia afzelii* and analyse its protein activity towards commercial antibodies against OspA, which later can be used as a target for aptamer development. The OspA gene was cloned into plasmid pET-28-a (+) and expressed in *Escherichia coli* BL21 (DE3) competent cells. Conditions of the type of growth media, additive components and induction time were optimized to obtain a high yield of the expressed protein. The expressed protein was then analysed using SDS-PAGE and Western blotting. The highest yield of recombinant OspA protein was obtained when Luria broth supplemented with 0.2% glucose was used as the growth media for 5 hours at 37°C. The purified protein showed reactivity with commercial antibodies against OpA, which indicates the expressed protein is well functioning. In conclusion, the recombinant *Borrelia afzelii* outer surface protein A (OspA) was successfully expressed and is reactive towards anti-OspA, which could potentially be used as a target for aptamer development.

PP1.51 Medical cannabis perception: a rapid review on selected diseases

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Cannabis plant has been used for its medicinal effects for almost 5,000 years. In December 2020, the United Nations Commission on Narcotic Drugs reclassified cannabis and its resin according to their therapeutic uses. However, debate on the medicinal value of cannabis continues to persist which necessitates a need for critical scientific evaluation. We conducted a systematised rapid review using predetermined keywords on selected databases on systematic reviews and/or meta-analyses of randomised controlled trials (RCTs) to evaluate medical cannabis use for selected medical conditions (Epilepsy, Parkinson's Disease, Cancer, and Glaucoma) based on the Global Health Data Exchange. Within the included 40 systematic reviews or meta-analyses, 102 RCTs were evaluated. The evaluations showed that certain medical cannabis products, such as Epidiolex, have significant health benefits for treatment-resistant epilepsies including Dravet, Lennox-Gastaut, and tuberous sclerosis complex syndromes. It was also found that a ratio of cannabidiol (CBD) to tetra-hydro-cannabinol (THC) is more effective for chronic cancer pain compared to CBD products alone. However, the scientific evidence remains inconclusive for other symptoms of cancer, Parkinson's Disease, and glaucoma. This variation is due to differences in intervention types, patients' conditions, and symptoms (e.g., severity within the disease), as well as safety outcomes. These factors also impact the certainty of evidence. In conclusion, evidence on the benefits and risks of medical cannabis for selected conditions remains scarce, due to methodological issues in most human trials. Improvements can be made through standardising dosage, considering confounding factors, and choosing suitable outcome measurements.

PP1.52 Retrospective analysis of disease spectrum in patients with elevated serum tryptase level

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Tryptase is a neutral serine protease and is the most abundant inflammatory mediator stored in mast cells. Acute increase in serum tryptase level indicates degranulation of mast cells through IgE-mediated or non-IgE-mediated mechanisms. In this study, an 18-month retrospective analysis of patient samples was conducted from January 2022 until June 2023. Serum tryptase level was determined using fluoroenzyme immunosorbent assay with Phadia 250 and a level of >20 ug/L is considered as significantly elevated. Patients with raised serum tryptase level were categorized according to their clinical features and diagnosis. There was a total of 14 patients with elevated tryptase level (21.2->200 ug/L) whereby the diagnosis was categorized into classical anaphylaxis reaction towards drugs (n=3), hematological disorders (n=3), mastocytosis (n=2), anaphylaxis reaction caused by bee sting (n=1), and five brought-in-dead (BID) cases with either undiagnosed mastocytosis or anaphylactic shock. In patients with classical anaphylaxis towards drugs, they showed a decreasing trend of tryptase level after the acute reaction. Elevated tryptase level could be seen in hematological disorders such as chronic eosinophilic leukemia, myelodysplastic syndromes, and acute leukemias. Patients with systemic mastocytosis also often have increased serum tryptase level as a result from episodic mast cell activation. Anaphylaxis is a severe and life-threatening condition which is indicated by elevated tryptase level. Therefore, a timely measurement of the serum tryptase level can identify patients with increased risk and enable the initiation of appropriate therapy to avoid the condition from worsening.



PP1.53 Serology describes heterogeneity in *Plasmodium falciparum* and *Plasmodium vivax* transmission intensities in Gua Musang, Kelantan

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Malaysia has achieved a substantial decline in malaria incidence over the past decades. A common feature of malaria-endemic settings is the requirement for more sensitive techniques to describe levels of low transmission. In this study, serological and parasitological methods were used to measure transmission levels of *Plasmodium falciparum* and *Plasmodium vivax* among the Orang Asli communities in Kelantan. A cross-sectional survey was conducted in three Orang Asli communities in Gua Musang, Kelantan, from June to November 2019. Antibody responses to *P. falciparum* (i.e. PfAMA-1 and PfMSP-119) and *P. vivax* (i.e. PvAMA-1 and PvMSP-119) blood-stage antigens were assessed by ELISA, while microscopy and molecular testing were used to determine parasite carriage by species. Age-adjusted antibody responses were analysed using a reversible catalytic model to calculate seroconversion rates (SCR). Of 645 participants, no evidence of recent transmission in the study areas was indicated by an absence of parasite infections in the community. The overall malaria seroprevalence was 38.8% for PfAMA-1, 36.4% for PfMSP-119, 2.2% for PvAMA-1 and 9.3% for PvMSP-119. Between study areas, the proportion of seropositivity varied significantly for any *P. falciparum* ($p < 0.001$) and any *P. vivax* ($p < 0.001$) antigens. Based on the SCR, there was a higher level of *P. falciparum* transmission than *P. vivax*, with heterogeneity in serological indices across study sites. This analysis shows accurate reconstruction of historical malaria transmission patterns in Kelantan using anti-malarial antibody responses. Demonstrating congruence between serological and parasitological measures suggests broader utility for serology in monitoring and evaluating of malaria transmission.

PP1.54 Serum IgG immune response after the first dose of BNT162b2, CoronaVac and ChAdOx1 vaccines in uninfected COVID-19 subjects

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COVID-19 vaccines aim to enhance the immune system's ability to recognize and neutralize the virus by inducing the production of antibodies, thereby providing protection against infection and reducing the severity of illness. Therefore, this study aimed to detect IgG antibody production in uninfected COVID-19 subjects after the first dose of three vaccines (BNT162b2, CoronaVac, and ChAdOx1). The blood samples were collected from 136 uninfected COVID-19 subjects before receiving the first dose (baseline) and before the second dose of the vaccine. The serum IgG antibody was detected against the SARS-CoV-2 spike protein (S1) receptor-binding domain using a SARS-CoV-2 IgG (sCOVG) kit by enzyme-linked immunosorbent assay (ELISA). Results showed that the percentage of detectable IgG in BNT162b2, CoronaVac and ChAdOx1 recipients was 100% (46/46), 33% (14/43) and 100% (47/47), respectively, before receiving the second dose of vaccine. In addition, the median IgG

levels of BNT162b2 and ChAdOx1 vaccine recipients were significantly higher than that of CoronaVac recipients ($p < 0.05$). Therefore, these findings indicated that the BNT162b2 and ChAdOx1 vaccines were able to elicit a more robust IgG antibody response than CoronaVac after a single dose in uninfected COVID-19 subjects. In fact, the data obtained from this study demonstrated that a second dose of the CoronaVac vaccine is crucial to stimulate a robust antibody response, thus, highlighting the significance of completing the full vaccination schedule.

PP1.55 Silencing of human papillomavirus (HPV16 and HPV18) E7 oncogene with RNA interference in cervical cancer cells

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E7 oncogene expression of human papillomavirus type 16 (HPV16) and type 18 (HPV18) is pivotal for malignant transformation and maintenance of malignant phenotypes. Silencing this oncogene driver is considered to be essential in molecular therapies for human cervical cancer. However, it remains unclear whether HPV16 and HPV18E7 can be silenced to obtain the most efficient antitumor activity by using RNA interference (RNAi) technology. Herein, we utilised a small interfering RNA (siRNA) targeting HPV16 and HPV18-E7 region to knock down the E7 expression. Firstly, both HPV16 and HPV18 were transfected with their respective lentiviral plasmid targeting the E7 region, while for HPV-negative, C33A was transfected with control shRNA lentiviral. Following post-selection, the knockdown cells were subjected to total RNA extraction, cDNA synthesis and analysis for target mRNA suppression by quantitative real-time PCR. Cells with more than 70% suppression of the target gene were analysed to determine their expression in transfected cells. Obtained data exhibited, a significant reduction in E7 expression where HPV18E7 knockdown demonstrated 97% and HPV16E7 knockdown exhibited 77% suppression against their respective controls. These transfected cells were then further evaluated via a time series experiment to confirm the sustained silencing of the target gene. These cells were harvested at specific time points: Day 2, Day 4 and Day 6. Our quantitative real-time PCR analysis found that HPV18E7 knockdown resulted in 97%, 97%, and 96% suppression of E7 on Day 2, Day 4, and Day 6, respectively. Whereas for HPV16E7 knockdown, our data showed 76%, 80%, and 79% suppression of E7 on Day 2, Day 4, and Day 6, respectively. Based on these findings, it appears that E7 knockdown in HPV16 and HPV18 can lead to E7 oncogene suppression. Therefore, utilizing E7 shRNA for RNA interference could be a promising gene-specific treatment option for HPV16 and HPV18-related cancers.

PP1.56 T-cell response in different demographic characteristics of COVID-19 vaccine recipients: a comparative analysis between Pfizer-BioNTech and Sinovac vaccines

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COVID-19 vaccines are widely administered to reduce morbidity and mortality due to COVID-19 infection and its related complications. Understanding the cellular immunity elicited by different types of COVID-19 vaccines is essential as humoral immunity wanes over time. This study aimed to compare the T-cell response after receiving the second dose of Pfizer-BioNTech or Sinovac vaccine among Malaysian adults. The T-cells response was determined from peripheral blood mononuclear cells (PBMCs) using an enzyme-linked immunospot (EliSpot) assay. The PBMCs were stimulated with SARS-CoV-2 peptides antigen and the interferon-gamma (IFN- γ) secreted by the T-cell was measured in the spot-forming unit (SFU)/106 PBMCs. The T-cell response elicited in



the vaccine recipients was analyzed based on demographic characteristics such as gender (male and female), age group (18–39 years old and 40–59 years old), and co-morbidities status (with or without co-morbidities). Results showed that Pfizer-BioNTech (n=13) and Sinovac (n=24) recipients had 100% reactive T-cell response after receiving the second dose of the vaccines. There were no significant differences in T-cell response for each demographic category within Pfizer-BioNTech or Sinovac vaccine recipients. These results indicate that both vaccines were able to elicit cellular immunity after the second dose of the vaccines. However, the median for T-cell response was significantly higher ($p < 0.05$) in the Pfizer-BioNTech than the Sinovac recipients for each demographic characteristic studied. Therefore, the Pfizer-BioNTech vaccine exhibited more robust cellular immunity than the Sinovac vaccine for various demographic characteristics of Malaysian adults.

PP1.57 Total dietary fibre of ten selected wheat flour-based traditional Malaysian dessert (*Kuih*)

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Dietary fibre are edible carbohydrate polymers with three or more monomeric units that are resistant to digestion and absorption in the human small intestines. Consuming 25-29g dietary fibre per day confers greatest benefits compared to lower consumption of dietary fibre. High intakes may reduce risk for developing obesity and non-communicable diseases (NCD). As one of most consumed foods among all ethnicities in Malaysia, *kuih* are mainly made from ingredients that might contribute to dietary fibre content. Thus, this study was conducted to investigate the total dietary fibre content in selected Malaysian traditional wheat flour-based local *kuih*. The selection of food samples was done based on the Protocol for Sampling and Methods of Analysis for Malaysian Food Composition (2011). The selected ten *kuih* were acquired from two different local stalls each, located in Selangor. The *kuih* acquired were freeze dried using freeze dryer (Pilot Freeze Dryer Virtis SP Scientific) and the total dietary fibre (TDF) was analysed by using enzymatic gravimetric method. The result showed that *Cucur Bawang* has the lowest value of TDF (2.584g/100g) while *Bahulu Kemboja* has the highest value of TDF (8.340g/100g). *kuih* with TDF values above 5g are *Pau Goreng Sambal* (5.823g/100g), *Kuih Apam Seri Ayu* (6.341g/100g), and *Karipap Sardin* (6.361g/100g), respectively. In conclusion, the TDF value may vary according to the different ingredients used such as the type of wheat flour used in the *kuih* preparation process. This data can be utilised to update and improve the Malaysia Food Composition Database.

PP1.58 Unlocking nature's treasure trove: elevating phytochemicals of leaves of *Garcinia mangostana* with deep eutectic solvents

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Phenolics and flavonoids enriching *Garcinia mangostana* (GM) has received substantial attention due to its contribution to antioxidant properties. However, there are concerns over utilization of standard organic solvents in phytochemical extraction process due to reported negative effects on human health. Thus, a safe alternative extractant of deep eutectic solvents (DES) has been proposed. A current comparative study between three major

classes of DES and three standard organic solvents is tested on leaves of *G. mangostana* to evaluate their extraction efficiency in recovering the phytochemicals. DES was first prepared by mixing hydrogen bond acceptor (HBA) and hydrogen bond donor (HBD) in specific ratio and water content. Then, mixed with dried samples and leave for 48 hours at room temperature. The filtered samples were then subjected to qualitative and quantitative analysis (total phenolics and flavonoids). All data were analysed using ANOVA and Tukey's range test were used for means of comparison. In brief, findings indicate that miscellaneous solvent extracts demonstrate various presentation of phytochemicals. Of all extracts, alcohol-based DES improved the extraction of total phenolics and total flavonoids compared to organic solvent (ethanol) by 30%. These results were in line with other previous research on mangosteen's fruit. In conclusion, it is feasible that DES can be utilised as alternative green solvents yielding high amount of phytochemical from medicinal plants possibility replacing or used in conjunction with standard solvents in extraction process.

PP1.59 Unlocking the gut health benefits of *Eucheuma denticulatum* and its beverage: an in-vivo study

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Eucheuma denticulatum (ED), a red seaweed commonly found along the coast of Sabah contains a plethora of nutrients that could potentially benefit gut health, notably, polysaccharides, which make up 40% to 60% of its composition. The current study aimed to evaluate the effects of ED and its drink product on the gut health of rats fed with a high-fat diet. A total of 30 male Sprague Dawley (SD) rats were randomly divided into 5 groups (n=6 per group) and fed with a normal diet (ND), high-fat diet (HFD), or HFD supplemented with ED (5% and 20%), and a beverage formulated with ED (FD) for 8 weeks ad libitum. At the end of the experimental period, the rats were euthanized by exsanguination (blood loss via cardiac puncture), and tissue samples were collected from the duodenum, jejunum, and ileum. These samples were then fixed in a 4% buffered formalin solution for morphological examination. Our results showed that 8 weeks of high-fat dietary intake led to intestinal abnormalities in the SD rats. However, the supplementation of ED and its beverage ameliorated intestinal morphology and barrier function. Morphometry of the ileal revealed an increase ($P < 0.05$) in villus height in all the seaweed-supplemented groups. Additionally, the FD group showed an increase in goblet cell count throughout the duodenum, jejunum, and ileum. Seaweed supplementation also activated gut-associated lymphoid tissue (GALT) formation which could enhance the adaptive immune response. In conclusion, ED and its beverage may have a potential effect to improve intestinal health.

PP1.60 Updates on melioidosis infection trend in Malaysia 2020-2021

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Melioidosis is endemic in Northern Australia and Southeast Asia countries including Malaysia. It is caused by *Burkholderia pseudomallei*, a gram-negative bacillus bacterium. The latest report on melioidosis infection rate in Malaysia was 16.4% (2015-2019). This retrospective study aims to determine the Melioidosis infection trend during pandemic period of COVID-19 infection (January 2020-December 2021) and its seasonal association with weather in Malaysia. A total of 10,892 serum samples of Melioidosis suspected patients were sent to Institute of Medical Research (IMR) and tested using an in-house IgM-ELISA for the detection of specific human antibodies to *B. pseudomallei*. The titre cut-off point for positive result was $\geq 1:320$. The Melioidosis infections showed



increasing trend from 2020 (17.2%) to 2021 (25.2%). It was slightly higher in female patients (22.6%). Sabah had the highest cases (30.9%) followed by Sarawak (30.4%) and Pahang (25.4%). Majority of cases showing high titre of $\geq 1:1280$ were from Sarawak (40.8%) compared to other states. Orang Asli contributed to the highest number of cases (35.9%) subsequently Sabahan (32.2%) and Sarawakian (30.7%). Most of the cases occurred during rainy season in the month of October to December. Sabah, Sarawak, and Pahang are the hotspot areas of Melioidosis in Malaysia. Disease prevention and control measures need to be enhanced in the hotspot areas particularly during rainy season.

PP1.62 Viability of splenocytes under different conditions for live cell analysis by flow cytometry- a pilot study

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One of the methods to determine the cellular immune response is by measuring the T-cell populations in the animal splenocytes using flow cytometry. For this method to work well, the spleen needs to be processed immediately into single cell suspension to ensure the highest cell viability can be obtained. However, in a situation whereby the spleen is obtained without the immediate access to flow cytometer, the possibility to recover the viable single suspension is uncertain. To determine the optimum condition to preserve these live cells, we design an experiment to observe the effect of different conditions on the viability of the splenocytes and subsets of T-cell population. There were four (4) conditions, i.e. (i) fresh preparation (n=2), (ii) cryopreserved (single suspension) (n=2), (iii) overnight culture (n=1), and (iv) 3-hour-delayed suspension (n=2). All single cell suspension was then stained with FVS780 to discriminate against the dead cells. The T-cells was stimulated by challenging the mice with *Pasteurella multocida* (*P. multocida*) (107 cfu/0.1mL) intranasally. Then, the live cells population was stained with antibodies corresponding to CD4+, CD8+, and other cytokines, i.e., TNF α , IFN γ , IL-10, IL-2, IL-4 for analysis by flow cytometer (BD FACScantoTM). Our result suggested that 3-hour-delayed preparation could still provide a comparable viability and T-cell population with the freshly prepared splenocytes. This investigation has provided us with the protocol of spleen treatment in such situation when immediate process of the spleen is not possible. However, this investigation warrants further investigation with a greater number of subjects and time points.

POSTER PRESENTATIONS: CLINICAL AND PUBLIC HEALTH

PP2.001 10-year risk for cardiovascular diseases using the WHO prediction chart: findings from the National Health and Morbidity Survey 2019

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Cardiovascular risk remains a pressing global health concern, affecting millions of people worldwide. In Malaysia, the prevalence of cardiovascular diseases causes significant challenge to public health. This study aimed to assess the distribution of 10-year CVD risk among adults aged 40 to 74 in Malaysia. The study utilised secondary data from the National Health and Morbidity Survey 2019, a national cross-sectional population-based study. Sociodemographic information, smoking status, total blood cholesterol, anthropometric measurements, systolic blood pressure, and fasting blood glucose were collected. The respondents' CVD risk was estimated using 2019 WHO CVD Risk laboratory-based charts for the South-East Asia region, which predict the 10-year risk of a major cardiovascular event. Among 5,503 respondents included in the analysis, the mean age was 55.22 years. Less than one-quarter of respondents were current smokers and obese. About 41.7%, 30.9% and 22.5% had very low (<5%), low (5% to 10%) and moderate risk (10% to <20%). Meanwhile, 4.9% was classified as having high (20% to <30%) and very high CVD risk ($\geq 30\%$), which was more common in men (7.3%) than women (2.5%; $p < 0.001$). Overall, the study found that about 5% of adults in Malaysia had substantial risks of developing CVD events over 10 years. These findings highlight the urgent need to implement effective interventions to reduce preventable burden of cardiovascular diseases in Malaysia.

PP2.002 Acceptability of medical marijuana associated with demographic and lifestyle factors

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In recent times, the decriminalisation of medical marijuana is becoming prevalent worldwide. Following the policies taken by other countries, the Ministry of Health Malaysia, plans to decriminalise the use of medical marijuana in health settings. Thus, this study was conducted to assess the acceptance of the legalisation of medical marijuana among our public to ensure a successful implementation of this initiative. This is a cross-sectional online survey, and the study respondents were Malaysian adults aged 18 years and above. Data was collected using a validated instrument. A total of 2,047 respondents participated. The study findings show 88.4% agreed to support the use of medical marijuana with supportive clinical evidence. Results also show a significant association between sociodemographic background, lifestyles, and acceptance of medical marijuana. Respondents who were male [χ^2 (2, $n=2,047$) = 242.45, $p < 0.001$], under B40 category [χ^2 (6, $n=2,047$) = 65.40, $p < 0.001$], aged 18-29 years old [χ^2 (6, $n=2,047$) = 31.076, $p < 0.001$], non-government employees [χ^2 (2, $n=2,047$) = 83.814, $p < 0.001$], smokers [χ^2 (2, $n=2,047$) = 284.52, $p < 0.001$], alcohol drinkers [χ^2 (2, $n=2,047$) = 62.18, $p < 0.001$] and drugs users [χ^2 (2, $n=2,047$) = 258.51, $p < 0.001$] were more likely to accept the legalisation of medical marijuana. These results are similar to previous research indicating acceptance of medical marijuana, which is related to sociodemographic and lifestyle factors. Thus, the findings can be used to guide policy makers in planning strategic dissemination of information pertaining to medical marijuana for the public.



PP2.003 Adequacy of preclinical evidence for conduct of herbal medicine clinical trials

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The National Committee for Research and Development of Herbal Medicine (NRDHM) was established to systematically coordinate and integrate the research and development activities on herbal medicine. One of the core functions of NRDHM is to review herbal medicine clinical research proposals for the adequacy of preclinical evidence and thus readiness of the herbal investigational product (IP) to enter clinical trials. Thus, we aim to assess the adequacy of preclinical data in herbal medicine research proposals received by NRDHM. From 2015 to 2022, the research proposals submitted by investigators were analysed for the completeness of scientific data. They were evaluated in terms of adequacy in preclinical data encompassing quality, standardisation, efficacy, and safety data of the herbal IP. These data were presented in the documents namely Study Protocol, Investigators' Brochure, Certificate of Analysis of the herbal IP, and Good Manufacturing Practice (GMP) certificate. A total of 42 herbal medicine clinical trial proposals have been submitted for NRDHM technical committee's review, with 7 (17%) from herbal industries, 19 (45%) from universities and 16 (38%) from public or private hospitals. Among them, 13 (31%) research proposals were acknowledged as fit for clinical trials and proceeded for further review by the Medical Research Ethics Committee (MREC). There were 19 (45%) research proposals that deemed inadequate data of the herbal IP to fulfil clinical trial prerequisite, majorly due to lack of standardisation, quality, and preclinical safety data. The other 10 (24%) proposals were unsuccessful in further review due to either the IPs being of non-herbal entity, or the investigators did not respond upon further enquiry. As a conclusion, the understanding of adequacy for preclinical requirements in the assessment of herbal IPs is slowly improving over the years.

PP2.004 Adverse effects of dietary supplements: a case series

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The public is frequently enticed to consume dietary supplements with exaggerated claims of health benefits. They would purchase dietary supplements based on their intended use without evaluating the detrimental effects or efficacy of the product ingredients. Herein, we illustrate the side effects of dietary supplements in three patients from Hospital Tuanku Fauziah. The first case, a 71-year-old man with multiple comorbidities, was well under medical treatment and follow-up. After two months on dietary supplements, he was admitted for acute liver and renal injury with fluid overload symptoms. After discontinuing the dietary supplements, his blood results normalised, and his symptoms resolved. In the second case, an 84-year-old man with peptic ulcer disease consumed a nutritional supplement for a month and developed upper gastrointestinal bleeding. Another case involved a 44-year-old lady on warfarin therapy for antiphospholipid syndrome (APS) who had a prolonged International normalised ratio (INR) after consuming several dietary supplements. The causation of these adverse effects with dietary supplements is difficult to confirm due to the presence of multiple confounding factors that are not adequately controlled at the time of diagnosis or if a product contains a mixture of undeclared active ingredients. The unclear division between the types of dietary supplements and the registration categories enables products to be adulterated without being detected. Thus, national data collection on the adverse effects of these dietary supplements should be established to demonstrate the actual burden on healthcare systems and reform the policy to ensure dietary supplements are examined for safety before being commercialised.

PP2.005 An overview of multidrug-resistant *Mycobacterium tuberculosis* from Sabah in a year 2021

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Tuberculosis (TB), caused by *Mycobacterium tuberculosis* (MTB), continues to impose a high burden on public health in urban and suburban areas worldwide. Currently, the relentless spread of multidrug-resistant tuberculosis (MDR-TB) stands as one of the most urgent and challenging issues in global TB control efforts. Presently, the spread of multidrug-resistant tuberculosis (MDR-TB) stands as one of the most urgent and challenging issues in global TB control efforts. Despite TB being a curable infectious disease, its mortality rate has been steadily increasing due to the emergence of drug resistance. The aim of this study is to analyse and identify the distributions of MDR-TB cases in Sabah. A total of 887 MTB isolates were collected from TB patients in 2021 across various regions in Sabah. These isolates were initially identified using a culture method on Ogawa media and subsequently confirmed through quantitative polymerase chain reaction, qPCR. Antibiotic susceptibility testing, conducted using the absolute concentration method (ACM) with the Seegene Annyplex II MTB/MDR kit, was performed on all identified isolate. Notably, the study revealed a predominance of TB infections in male patients compared to females. Among the isolates, 143 cases were identified as MDR-TB, with mutations found in genes such as *rpoB*, *katG*, or *inhA*, or a combination of these. The majority of resistant MTB strains were observed in Kota Kinabalu. These preliminary findings hold great significance as they serve as a pilot study for understanding TB and MDR-TB cases in Sabah. Moreover, the results can aid in enhancing TB management strategies in Malaysia.

PP2.006 Anti-S antibodies among four types of vaccines in Malaysia: after a year

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Monitoring SARS-CoV-2 antibody levels can provide insights into a person's immunity to COVID-19 and inform decisions about vaccination and public health measures. Anti-S may be useful as an indicator of an effective immune response. This study aims to determine the immune response of anti-S antibodies against SARS-CoV-2 for all the vaccine types ministered over time among adult recipients in Malaysia. This cohort study recruited 2,513 respondents aged 18 years and above from June 2021 to December 2021, conducted across multiple selected sites in Malaysia. Each participant was followed up for one year from baseline. The respondents were divided into four groups based on the vaccine they received. Overall, anti-S antibody levels increased for all vaccine types and peaked at 2 weeks after completing vaccination, with Pfizer recipients having the highest median level of 100 (100.00-100.00). By the third-month follow-up, the seropositivity of anti-S antibodies and median levels decreased for all vaccines. However, individuals who received a booster dose had higher levels of anti-S antibodies compared to those who did not receive a booster. Based on the Kruskal-Wallis and Mann-Whitney tests, significant differences ($p < 0.001$) in median levels were observed between vaccine types, infection status, and booster status at all time points (follow-ups). Although anti-S antibody levels declined, the protective threshold remains unknown. Decreased levels don't imply lack of protection. Vaccination, regardless of type, provided immunity as COVID-19 cases declined over time.

**PP2.007 Anti-spike antibodies response to SARS-CoV-2 vaccines by BMI status in adults in Malaysia**

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During the pandemic, people with obesity were more likely to be hospitalised, require ventilators and to die from SARS-CoV-2. This study aims to describe the patterns of anti-Spike IgG (anti-S) antibodies induced by four types of SARS-CoV-2 vaccines (Pfizer, Sinovac, AstraZeneca and CanSino) among adults in Malaysia by BMI status (underweight, normal, overweight, and obese). We used data from the IMSURE study, a cohort study recruited 2,513 respondents aged ≥ 18 years from June 2021 to December 2022. Data was analysed, describing the median with 25th, and 75th percentiles of anti-S antibodies from each follow-up. After a year, the study retention rate was 45%. No different patterns were observed among all BMI groups. Generally, after completed vaccination, only Pfizer recipients recorded index of 100 for all BMI groups. Antibodies level were declining until 3 months follow-up and rise again at 6- and 9-months follow-ups. At 3-month follow-up, underweight recorded lowest anti-S antibodies among Sinovac [median=2.3 (1.9-7.1)] and Cansino recipients [median=12.8 (5.4-61.2)]. At 6-month follow-up, obese Pfizer recipients showed the lowest anti-S antibodies [median=17.3 (5.7-100.0)]. All BMI groups of Pfizer, Sinovac and AstraZeneca recipients show highest antibodies level at 9-month follow-up whereas anti-S antibodies level in all CanSino recipients show a decline. Lowest anti-S antibodies were seen among underweight AstraZeneca recipients [median=38.4 (12.5, 100.0)], and among overweight CanSino recipients [median=38.4 (12.5, 100.0)]. These findings have important implications for vaccine prioritisation policies for the nation.

PP2.008 Application of margin of exposure approach to assess the cancer risk of aristolochic acids from herbal supplement consumption

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The assessment of traditional food-borne contaminants' risk in predicting and preventing human cancer is complex. Currently, margin of exposure (MOE) approach is preferred for low exposure of genotoxic and carcinogenic compounds in food such as aristolochic acids (AAs), the Group 1 carcinogen. In protecting public health, the contemporary practices must be adequate and strengthened to evaluate the exposure of AAs. This study aims to apply the MOE approach in the assessment of AAs cancer risk of herbal supplements from Malaysia. This quantitative risk assessment involved analytical study of 30 herbal supplements, purchased from the Malaysia online market and analysed using ultra-performance liquid chromatography technique. The estimated daily intakes (EDIs) were calculated based on recommended daily consumptions determined by herbal supplement's product descriptions. The benchmark dose lower-bound confidence limit 10% (BMDL10) for interest responses were derived based on selected animal studies. The MOE values were calculated, and risk assessment was conducted based on the MOE values of 10,000 that represent 10 times cancer risk. 5 out of 30 (16.7%) herbal supplements samples were positive with AAs ranged from 8.7 ± 0.2 to $4,259.1 \pm 1,231.3 \mu\text{g g}^{-1}$. The EDI values were much higher than the BMDL10. The MOE values of all AAs containing samples were much lower than 10,000 indicated the high cancer risk among the AAs containing herbal supplement consumer. The MOE approach can be used to assess the cancer risk of AAs through the consumption of herbal supplements, revealing a significant cancer risk and highlighting the need for risk management.

PP2.009 Assessing mental health outcomes in quarantine centres: a cross-sectional study during the COVID-19 pandemic

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Quarantine centres were exclusively designed to accommodate persons under surveillance (PUS) during the COVID-19 pandemic. It was a part of comprehensive mitigating strategies to ensure better isolation adherence among PUS as compared to self-quarantine at home. These unprecedented measures would affect their mental health, including healthcare workers who worked at the quarantine centres. This study aimed to assess mental health outcomes and associated factors among PUS and frontline workers across 49 quarantine centres in Selangor, Malaysia. The analysed data was obtained from the Mental Health and Psychosocial Support Services (MHPSS). A total of 4,577 samples were included in this study that utilised the Depression, Anxiety, and Stress Scale (DASS-21) as the measuring tool. The result showed prevalence of stress at 0.9%, anxiety at 11.4%, and depression at 10.2%. Being a frontline worker and aged below or at 30 years old were found to be the significant predictors of having all three of the adverse mental health outcomes. Additionally, females showed higher odds of having stress (OR=1.508, 95% CI=1.160-1.959) and anxiety (OR=1.335, 95% CI=1.100-1.620). Those who were quarantined in the institutional facilities, and quarantine periods of more than 7 days were significantly prone for anxiety. In contrast, employed persons tend to have significantly lower odds of anxiety (OR=0.620, 95% CI=0.438-0.879) and depression (OR=0.591, 95% CI=0.412-0.847). As a result, the availability of a mental health support team is the key to creating a conducive quarantine environment. Thus, the preparedness to execute this service is important in facing future public health emergencies.

PP2.010 Assessing the potential of an autodissemination approach for the control of vector mosquitoes

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It is important to eliminate *Aedes* larvae in cryptic and small containers to reduce dengue virus transmission. However, existing vector management strategies might not sufficiently control *Aedes* spp. and their impact on public health. Our study assessed the potential of autodissemination approach in dispersing pyriproxyfen to *Aedes* spp. oviposition sites in dengue hotspots areas specifically Dataran Automobil Shah Alam, Selangor. The study was conducted for nine months, consisting of two months prior to PPF dissemination, six months of citywide PPF dissemination, and one-month post-PPF dissemination. Initially, conventional ovitraps were deployed for the trials. The ovitraps was observed at weekly intervals and larvae were identified by species to determine the ratio of *Aedes* sp. In the third month, the autodissemination device was deployed to the treatment areas for six months and the larvae density and ratio of *Aedes* sp. were continuously recorded until the end of the trials. The status of insecticide transference in ovitrap and autodissemination device was determined using the WHO larval bioassays protocols. Our findings demonstrated that autodissemination serves as an effective strategy for attracting mosquitoes for oviposition, with 100% complete inhibition against eggs and larval development. Laboratory larval bioassays using water collected from ovitrap showed up to 40% larval mortality, with a significant reduction in the



Aedes spp. population in treatment sites compared to control areas. Furthermore, insecticide was successfully transferred to non-treated containers and significantly reduced the mosquito population. These autodissemination strategies could be considered as a long-term *Aedes* prevention method in vector management programme.

PP2.011 Association between functional disability and depression among elderly: is there any gender difference?

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It is well recognised that women are more susceptible and preponderance in risk of having depression particularly in older age in view of ageing is associated with decline in daily function. Therefore, the aim of this study is to investigate gender differences in functional disability for depression among elderly. The data from National Health and Morbidity Survey (NHMS) 2019 were used for this study. A total of 2,504 respondents were analysed in which only elder people aged 60 years and above were selected. Patient Health Questionnaire (PHQ-9) was used to assess and detect depression. The respondents who had score 10 and above were considered to have depression. Functional disability was assessed using the Washington Group Questionnaire. The overall disability was defined as having a lot of difficulty in two domains or cannot do at all-in-one domain. Descriptive and logistic regression analysis were performed to determine the association of functional disability with depression stratified based on gender. This study showed that the prevalence of depression of elderly people was 2.3%. The percentage of women of having depression was higher compared to men (2.8% vs 1.7%). This study also found that women who had functional disability had 6.0 times more likely of having depression as compared with those who did not have function disability [p-value <0.0001 (95% CI: 2.37, 14.65)]. In addition, men also had 5.9 times odds of having depression if the functional disability was present [p-value <0.001 (95% CI: 2.00, 17.56)]. From this study, showed that functional disability appears to contribute to depression regardless of genders.

PP2.012 Association between weight changes and health-related quality of life improvement among overweight and obese adults

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The relationship between obesity and health-related quality of life (HRQOL) is clearly established. However, the role of weight loss following dietary intervention in improving HRQOL is inconclusive. This study examined the association between weight changes following intermittent fasting and healthy plate interventions and improvement in HRQOL domains (self-image, social stigma, trying to lose weight, and physical) as measured using the Obesity and Weight Loss Quality of Life (OWLQOL) questionnaire among overweight and obese adults. This was a quasi-experimental study involving a total of 177 participants. The multiple logistic regression analysis was used to determine the association between weight changes and improvement in HRQOL. p-values of <0.05 are considered statistically significant. Most of the participants were female (n=147, 83.1%) with the mean age of 34.47 years (SD 7.40). The logistic regression models adjusted for sex, age, and intervention group indicated participants with ≥5% weight loss were three and five times more likely to report a better score in self-image [OR 3.30 (95% CI: 1.01, 10.83)] and trying to lose weight domains [OR 5.72 (95% CI: 1.71, 19.08)], respectively, compared to those who showed no improvement in weight. Otherwise, there was no significant association observed in other domains. Our study found that the likelihood of achieving improvement in HRQOL in several domains was significantly higher among those who attained ≥5% weight loss. This finding showed the benefits of weight loss following dietary intervention extended beyond physical health.

PP2.014 Breastfeeding situation in Malaysia: findings of National Health and Morbidity Survey 2022 (Maternal and Child Health)

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Early breastfeeding initiation and continued breastfeeding for at least two years has numerous nutritional and immunological benefits. The purpose of this study is to describe the rate of early initiation of breastfeeding (EIBF), ever breastfed and continued breastfeeding until two years old in Malaysia. Data on breastfeeding were extracted from the National Health and Morbidity Survey 2022 (Maternal and Child Health). This survey was a cross-sectional design with a two-stage stratified cluster sampling. Structured questionnaire with face-to-face interview was used for data collection among mothers aged 15-49 years with last childbirth less than two years prior to the survey and their children below five years. Data were analysed using SPSS version 28.0. A total of 25,413 respondents were interviewed with response rate of 74.9%. The prevalence of EIBF within one hour of birth was 64.3% (95% CI: 61.11, 67.36) and there was no significant difference between sex and locality. About 94.9% (95% CI: 93.87, 95.80) of children born in the last 24 months who were ever breastfed. Meanwhile, the prevalence of continued breastfeeding among children aged 12 to 23 months old was 50.6% (95% CI: 46.94, 54.25). This study demonstrates that EIBF still can be improved as the findings showed that only six in 10 newborn infants have begun breastfeeding within 1 hour of birth and only one in two children continued to breastfeed until 2 years. Promotion on EIBF and to strengthen the support for the mother and spouse to breastfeed exclusively should be continued as per recommended.

PP2.015 Cancer health literacy and its association with adherence to oral anticancer therapies in a multi-ethnic Asian setting: a cross-sectional study

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The lower a person's health literacy level, the more difficult it will be to comprehend information on correct medication intake. Assessment of health literacy among cancer patients may offer actionable insights to improve adherence to cancer therapies in routine clinical practice. Therefore, this study is to assess cancer health literacy and its association with adherence to oral anticancer therapies among cancer patients in a multi-ethnic, middle-income setting. A cross-sectional survey of 189 cancer patients who are on oral anticancer therapies was conducted at the University of Malaya Medical Centre (UMMC), *Hospital Canselor Tuanku Muhriz UKM* (HCTM) and Kuala Lumpur General Hospital (HKL). Data on patients' characteristics were collected using an interviewer-assisted questionnaire. Cancer health literacy was evaluated using Cancer Health Literacy Test (CHLT-30), while adherence to oral anticancer therapy was assessed using Medication Compliance Questionnaire (MCQ). Multivariable logistic regression analysis was employed. A total of 189 patients were enrolled, of which a majority were female, from low-income households, who obtained education until secondary school and of Malay descent. The overall mean score for cancer health literacy was 17.85 out of 30, with a vast majority scoring in the intermediate range. There were significant differences in mean scores by age group, education level and household income level. A total of 101 (53.4%) participants were adherent to oral anticancer therapy. Oral anticancer therapy adherence was associated with comorbidities [aOR=0.24 (95% CI: 0.12, 0.48)], presence of side effects [aOR=0.23 (95% CI: 0.11, 0.47)], and endocrine therapy [aOR=0.45 (95% CI: 0.20, 0.99)]. Cancer health literacy in this cancer population appeared to be moderate. This study this study did not find a statistically significant association between cancer health literacy and adherence to oral anticancer therapy among cancer patients after adjusting for confounders ($p > 0.05$).



PP2.016 Cardiometabolic risk factors among children with severe obesity after a school-based lifestyle modification intervention

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Children with severe obesity are associated with an increased prevalence of cardiometabolic risk factors (CRFs). They are more likely to remain obese in adulthood and develop obesity-related complications. The American Academy of Pediatrics (AAP) has recommended shifting focus to CRFs clustering which is often associated with childhood obesity and applying the most intensive intervention effort to be used to lower the risks. Obesity management in the form of lifestyle modification during childhood has been suggested as the first-line strategy. This study included a total of 102 children with obesity aged 8-16 years who completed a 16-week school-based lifestyle intervention program, MyBFF@school phase I in 2014. Children with severe obesity were further classified as class 2 and class 3 obesity according to the AAP 2023 clinical practice guidelines. Metabolic status was defined based on the 2018 consensus-based criteria. At baseline, children with class 3 obesity were 8.5 times more likely to get high systolic blood pressure (SBP) when compared to class 1 obesity (OR: 8.5 (95% CI: 1.5, 47.9), p-value=0.01). Among children with class 1 obesity, the likelihood of having metabolically unhealthy status was 57% lower at week-16 of the intervention (OR:0.43 (95% CI: 0.19, 0.98), p-value = 0.04) compared to baseline, however, no changes were observed among class 2 and class 3 obesity. In conclusion, our intervention study has been proven effective in lowering the cardiometabolic risks. However, a more rigorous intervention regimen targeted at children with severe obesity is warranted especially in the management of SBP.

PP2.017 Caregiver and depressive symptom: analysis of labour productive age group

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Malaysia is expected to be an ageing nation by 2030, resulting in a high demand for informal caregivers for older people. The caregiving burden can be significant and impact the mental well-being of caregivers in the absence of sufficient support. This study aims to identify determinants of labour-productive caregivers with sadness/depressive symptoms. This study used the Malaysia Ageing and Retirement Survey (MARS) Wave 1-2018/2019 cross-sectional data, focusing on the labour-productive individual aged 40-59, providing care to parents and/or parents-in-law requiring care, either as primary caregivers or non-primary caregivers. The total number of caregivers in the sample was 421. In this analysis, "always" is considered yes for sadness/depressive symptoms, measured by "How often did you experience sadness/ feeling blue/ depressed?" We conducted binary logistic regression for sadness/depressive symptoms. The analysis was performed using SPSS 28. Primary caregivers constituted 28.5% of total caregivers. Only 4.8% of caregivers reported experiencing sadness/depressive symptoms. After adjusting for other variables, the likelihood of experiencing sadness/depressive symptoms was higher among females, individuals with no/primary education and with at least one illness. Being a primary caregiver and perceived level of support availability did not reach significance. Healthcare providers should be more sensitive in detecting or probing depression among caregivers with these characteristics. This study highlights some vulnerable subgroups among caregivers for early detection and prevention in the provision of adequate support for aged care caregivers. Focusing on the challenges faced by these individuals in preventing depression is necessary for their well-being.

PP2.018 Cholesterol point-of-care testing (POCT) in epidemiological surveys using Cardiochek® PA analyser: a validity and reliability study

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The National Health and Morbidity Survey (NHMS) has been using point-of-care testing (POCT) to screen raised blood cholesterol levels (total cholesterol only) since 2011. Since parameters of blood cholesterol, total cholesterol (TC), triglycerides (TG), high density lipoprotein (HDL) and low-density lipoprotein (LDL) are important to derive the Framingham risk assessment score to determine 10-year cardiovascular risk in a patient, a study was conducted to test reliability and validity of the CardioChek® PA analyser 3-in-1 lipid panel. It utilised a cross sectional study design with quota sampling. A total of 203 respondents from a research centre under Ministry of Health Malaysia, aged 18 years and above, were recruited. Venous blood was sent to the laboratory while the POCT analyser was used for capillary blood. Intraclass Coefficient Correlation (ICC) analysis was employed to determine the agreement between capillary and venous blood readings. The agreement between capillary and venous blood was TC: 0.670 (95% CI 0.26, 0.81, $p < 0.001$); TG: 0.913 (95% CI 0.88, 0.94, $p < 0.001$); HDL: 0.638 (95% CI 0.20, 0.82, $p < 0.001$); LDL: 0.749 (95% CI 0.55, 0.85, $p < 0.001$). CardioChek® PA analyser 3-in-1 lipid panel showed moderate reliability between capillary and venous blood for TC and HDL whereas good reliability for TG and LDL. Sensitivity and specificity were 53.3% and 96.6% respectively. Positive Predictive Value (PPV) and Negative Predictive Value (NPV) were 94.9% and 63.4% respectively. This analyser is a reliable and valid POCT that can be utilised in epidemiological studies as well as in remote areas with restricted access to laboratories.

PP2.019 Clinical characteristics of lupus nephritis patients with different ancestral background in Malaysian population: are they the same?

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Several factors were reported that may influence the disease expression in patients with lupus nephritis (LN), including ancestral background. There is very little data reported on the disease expression in Malaysian LN patients, less to mention across the different ethnic groups. In this present study, we reported the ethnic differences in the disease expression among the LN patients in Malaysia. This is retrospective cross-sectional study involving a total of 176 biopsy-proven LN patient with different ancestral background, i.e. 90 Malays, 70 Chinese, 8 Indians, and 8 mixed-ethnicities visiting the nephrology clinic at Hospital Raja Permaisuri Bainun, Malaysia. The clinical data was collected from the medical record using a standardized data collection form. Overall, the mean age of the LN patients was 40.9 (± 13.3) years old, where 90.3% were women. Our data demonstrated significant younger age at diagnosis in the Malays (29.1 \pm 11.7 years old) compared to Chinese (36.0 \pm 14.2 years old) and Indians (43.5 \pm 15.6 years old) ($p < 0.01$), whilst significant longer disease duration in the Indians (8.5 \pm 6.4 years) was observed when compared to Malays (6.9 \pm 7.0 years) and Chinese (7.9 \pm 7.0 years) ($p < 0.01$). The histological assessment showed LN class IV predominated in all the three major ethnic groups (Malay: 52.2%, Chinese: 61.4%, Indian: 75.0%). Overall, arthritis (35.8%) was the commonest clinical manifestation followed by malar rash (30.1%) and alopecia (26.7%). This pattern was, however, observed only in the Malay and Chinese ethnic groups, but not in the Indian ethnic group. Our findings validated the reported ethnic differences in Malaysian LN patients and justify the needs of genetic variants identification to explain the differential risk of LN across ethnic groups.



PP2.020 Clinical presentation of neonatal onset inborn errors of metabolism: a case-control study

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Inborn errors of metabolism (IEM) are a genetically and phenotypically heterogeneous group of disorders resulting from a defect in a metabolic pathway. This paper aims to describe the associated factors to positive inborn errors of metabolisms (IEM) screening in neonates. A case-control study was performed using data retrieved from the Integrated Laboratory Information System (ILIS) database of the Institute for Medical Research (IMR), Kuala Lumpur. Neonatal specimens sent for IEM screening from January 2021 till March 2023 for dried blood spot, plasma amino acids and urine organic acids were collated. "Cases" were defined as samples with positive results from all three testing (including positive complementary testing performed due to a non-diagnostic profile). "Controls" were conveniently selected (ratio of 3:1) among those with no abnormality detected in all three tests. Logistic regression analysis was performed to determine the degree of associations. A total of 113 data were pooled with 29 positive cases (25.7%). Majority were males (57.5%) with the mean age of 15.0±9.93 days. Positive cases were significantly younger ($p<0.001$), had hyperlactatemia ($p=0.011$), and higher ammonia level ($p=0.002$). Hypotonia (OR:5.31, 95%CI: 2.06, 13.71, $p=0.001$) and non-specifically unwell (OR: 3.37, 95%CI: 1.37, 8.29, $p=0.008$) emerged as clinical signs significantly associated with IEM positivity. Presence of hypotonia and a child non-specifically unwell presenting in the first two weeks of life with hyperammonemia and hyperlactatemia were significantly associated with positive IEM screening in neonatal period. These clinical signs may guide clinicians to suspect IEM and prompt early screening.

PP2.021 Comparative analysis of SARS-CoV-2 antibody titres between male and female adolescents who received the BNT162b2 vaccine

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Measurement of the serological response to SARS-CoV-2 immunization is necessary to establish a correlation between vaccination response and effective protective immunity. This study aimed to determine the SARS-CoV-2 antibody titres between male and female adolescents. This was an observational cohort study. The participants were adolescents aged 12 to 17 years old who received the BNT162b2 vaccine for SARS-CoV-2 and had no previous history of COVID-19 infection. Blood samples were collected at seven different follow-up times. All blood samples were tested for SAR-CoV-2 anti-spike-IgG antibodies. Data was analysed using descriptive statistics and independent t-tests. Out of 153 participants, 96 were included with a mean age of 14.18± 1.71. 59.4% (n=57) were male and 40.6% (n=39) were female. The seropositive rate raised to 100% in both male and female at first dose follow-up and maintained until the end (12 months). Higher titres were seen in females [28.37 (20.27, 53.31)] compared to male [24.71 (12.42, 77.23)] at first dose follow-up. The upper limit of detection from 25th percentile and above [100.0 (100.0, 100.0)] were reached at completed vaccination and at month 3 follow-up in both sexes. At month 6 to month 12 follow-up showed a trend of decreasing antibodies titres at 25th percentile ending with 100.0 (72.26, 100.0) in male and 100.0 (30.78, 100.0) in female. However, there were no significant differences between the antibody titres and sex at first dose [$t(84)=0.127$, $p=0.900$], completed dose [$t(73)=0.099$, $p=0.922$], month 3 [$t(67)=0.668$, $p=0.506$], month 6 [$t(58)=0.395$, $p=0.694$], month 9 [$t(52)=0.682$, $p=0.498$] and month 12 [$t(35)=0.476$, $p=0.568$] of follow-up. Vaccination generates strong immune responses and remains an important way to provide adolescents' host protection against COVID-19.

PP2.022 Comparison of climate patterns between small islands and coastal cities in Malaysia

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Climate factors are closely related to health vulnerability, as it plays a significant role in determining the vulnerability of populations to various health risks. Currently, assessments on health vulnerability mainly focus on coastal regions and major cities, overlooking small islands, partly due to the absence of specific local climate data. Thus, this study aimed to utilise global climate model data to identify climate patterns on small islands and to compare with nearby coastal cities. Daily mean temperature and precipitation data from 2010-2020 were obtained from the ECMWF fifth-generation reanalysis (ERA5) dataset available on the ClimateEngine.org. This dataset involved three small islands and their pairing coastal cities in East Coast Peninsular and Sabah. The yearly mean temperature ranges for the 11 years showed to be higher for all the islands compared to their respective nearby coastal cities (Tioman Island: 26.78-27.57°C versus Kuantan: 26.20-27.32°C; Perhentian Kecil Island: 27.06-27.85°C versus Kuala Terengganu: 26.94-27.59°C; Mantanani Besar Island: 27.08-27.58°C versus Kota Kinabalu: 26.96-27.60°C). Perhentian Kecil and Tioman Island received total precipitations of 26,789 mm and 26,511 mm respectively, which were lower compared to their nearby coastal cities, Kuantan (30,190 mm) and Kuala Terengganu (29,432 mm), suggesting a potential water shortage challenge on both islands. The findings highlighted that small islands experience higher temperatures and varying precipitation patterns compared to nearby coastal cities, emphasizing the need to include these regions in health vulnerability assessments to address climate-related health risks.

PP2.023 Comparison of machine learning approaches for undiagnosed diabetes detection using dietary history and physical activity patterns

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Machine Learning (ML) algorithms are becoming increasingly influential in health analytics, offering early detection of risk trajectories for chronic diseases such as diabetes. In this study, we developed and compared different ML models for detecting diabetes in undiagnosed individuals based on dietary history and physical activity patterns. Three ML approaches were utilised— i.e., Logistic Regression (LR), Random Forest (RF), and XGBoost. Model training utilised demographic characteristics, physical activity and fruit-vegetable intake data from the National Health and Morbidity Survey 2015. The robustness of these models was evaluated using several evaluation metrics, including accuracy, positive predictive value (PPV), recall, specificity, F1-score, Area Under the Receiver Operating Characteristics (ROC-AUC) scores, and the Shapley Additive Explanations (SHAP) metrics, enhancing the interpretability of the model outputs. All three models showcased high accuracy (0.88-0.89) and recall (0.99-1.00), indicating strong overall predictive performance and sensitivity. However, specificity was markedly low for RF and XGBoost models, indicating a potential for false-positive outcomes. Among the models, XGBoost displayed a marginally superior performance with the highest ROC-AUC score (0.66), followed by RF (0.65) and LR (0.64). SHAP values highlighted those residing in Selangor, individuals in private-sector employment, and individuals of Chinese ethnicity as strong positive predictors for undiagnosed diabetes. Given their high accuracy and sensitivity, these ML models could serve as potential tools for mass screening programs, promoting proactive public health interventions. However, the models need further refinement to improve specificity and reduce over-diagnosis. Applying ML-based predictive analytics in public health screening opens new possibilities for improving population health.



PP2.024 Complete primary vaccination coverage and its association with children's sociodemographic factors in Malaysia: findings from the National Health and Morbidity Survey (NHMS) 2022

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Vaccination reduces mortality from vaccine preventable diseases. The Global Vaccine Action Plan has set a target of 90% vaccine coverage rate for all vaccines included in the child vaccination programs. Therefore, this study aimed to evaluate the complete verified primary vaccination coverage and its sociodemographic association among children aged 12–23 months in Malaysia. The data from the National Health and Morbidity Survey (NHMS) 2022: Maternal and Child Health were analysed (n=3,463), a nationwide cross-sectional survey with a complex design. A two-stage stratified random sampling was employed, encompassing all states in Malaysia. Complete verified primary vaccination was defined as children who received all scheduled primary vaccines by age one, verified through their health record books. Complex multiple logistic regression analyses were conducted to identify the association. The overall prevalence of complete verified primary vaccination among children was 83.5% (95% CI:80.93,85.76). Multivariable logistic regression analyses revealed that children from Johor, Kedah, Melaka, Negeri Sembilan, Pahang, Perak, Selangor, Terengganu, and Sarawak were significantly associated with complete vaccination. Furthermore, Malaysian children (aOR:19.23 95% CI:5.22,70.8) are more likely to complete their vaccination schedule, while children of Chinese (aOR:0.18 95% CI:0.04,0.72) and Indian (aOR:0.12 95% CI:0.03,0.58) ethnicity are less likely to have incomplete vaccination. The present study demonstrated that vaccination coverage is still unsatisfactory according to WHO criteria. Additionally, the result is lower than NHMS 2016 (86.4%), suggesting that the COVID-19 pandemic may have affected vaccination uptake in Malaysia. The current intervention programs need to be intensified to trace defectives or children who missed vaccinations.

PP2.025 Considerable yield of opportunistic anaemia screening among patients with dengue-like symptoms and factors associated with anaemia diagnosis among them at a public primary care clinic in Selangor

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Anaemia is a global health concern that affects primarily pregnant women and children. It can go undetected but is easily diagnosed with a simple blood count. Scheduled health screening take-up is low in Malaysia, but opportunity arises at every healthcare contact. This study aims to determine the prevalence of anaemia and its associated factors among patients presented with dengue-like symptoms at a public clinic in Selangor. Secondary data from a prospective cross-sectional study that recruited all patients presented to Klinik Kesihatan Seksyen 7, Shah Alam, Selangor from November 2017 to March 2018 with dengue-like symptoms were used. Socio-demographic characteristics and haemoglobin level were retrieved. Anaemia and its severity were defined according to the classification of the World Health Organization. Stata v12 was used to perform descriptive and subgroup analyses, and chi-square and Fisher's exact tests. Among the 493 patients included in the analysis, majority were ≥ 15 years old – 449 (91.1%), male – 284 (57.6%), and Malay – 394 (79.9%). A total of 44 (8.9%) people were anaemic, with 25 (56.8%) being mild, 17 (38.6%) – moderate, and 2 (4.6%) – severe anaemia. The prevalence of anaemia was highest among children < 5 years – 3 (18.8%), female – 35 (16.8%), and Chinese – 1 (20.0%). Only female sex was significantly associated with anaemia diagnosis ($\chi^2=27.3$, $p<0.0001$). Almost one in 10 patients who sought medical attention for dengue-like symptoms had anaemia. Opportunistic screening upon healthcare contact for other purposes provides an additional avenue to detect anaemia in the general population.

PP2.026 Construct validity and reliability of the Malay version of the fagerström test for nicotine dependence (FTND): a confirmatory factor analysis

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The Fagerström test for nicotine dependence (FTND) is a widely used instrument for measuring nicotine dependence. The aim of this study is to determine the best model for the Malay version of the FTND (FTND-M). We used a single forward and backward translation to develop the Malay language (FTND-M) of the FTND and administered it to 152 daily smokers who sought treatment for smoking cessation in government health clinics in Selangor state, Malaysia. Using confirmatory factor analysis (CFA), four measurement models of the FTND-M with the best relative fits were compared: one uni-dimensional model, and three two-domain (morning and daytime smoking) models. The findings indicate that the best model of the FTND-M was a two-domain model, wherein domain one represented morning smoking (time to first cigarette of the day, smoking more in the morning, and which cigarette would you hate to give up) and domain two represented daytime smoking (cigarettes per day, difficulty refraining from smoking, and smoking when ill) which showed good model fit [$\chi^2/df=1.932$, goodness of fit (GFI) of 0.967, comparative fit index (CFI) of 0.945, incremental fit index (IFI) of 0.98, Tucker-Lewis index (TLI) of 0.95 and root mean square error of approximation (RMSEA) of 0.079, and substantial reliability >0.70]. This study indicates that the FTND-M can be used to assess these two dimensions of nicotine addiction among daily smokers in a clinical setting.

PP2.027 Consumption of ultra-processed food and the eating location: from adolescents and parent perspective

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Studies indicate that eating locations can influence food choices and consumption of ultra-processed food (UPF). Given the rising rates of poor nutrition habits and an increase in non-communicable diseases, overweight and obesity, the objective of this study was to explore the perspectives of adolescents and parents' regarding the consumption of ultra-processed food and its relation to eating location. A qualitative study based on Socio Ecological Model was conducted on purposive, multi-ethnic samples of 27 mothers and 51 adolescents from four regions in Malaysia [Southern (Johor), Central (Selangor), Northern (Kedah) and East Coast (Terengganu)]. In-depth interviews were utilised for data collection, which were audio-recorded, fully transcribed, and qualitatively analysed using Atlas.Ti 8.0 software. The transcribed data were grouped into several themes and sub-themes which were then categorized under different factors such as individual, social, and environmental. The findings revealed that several multifaceted factors contributed to the consumption of ultra-processed food (UPF). These factors included availability and convenience of UPF, taste preferences, affordability, marketing and advertisement, social influences, and time constraint due to parents' work commitments. The present study showed various factors contributed to consumption of ultra-processed food at different eating location, emphasizing the need for specific programs aimed at raising awareness and knowledge among parents and adolescents particularly at an early age.



PP2.028 Content validation of a health intervention module for type 2 diabetes adults with obesity: the Chance2Act intervention

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In type 2 diabetes (T2D) adults, weight loss can improve hemoglobin A1c, blood pressure, blood lipids, quality of life and reduce the frequency of medications needed. Unfortunately, health intervention module promoting behaviour change for weight loss targeted on this population is still scarce. The purpose of this study is to evaluate the content validity of the Chance2Act health intervention module designed to promote behaviour change for weight loss among T2D adults with obesity. The content validity of the instrument was investigated based on the view of six panel experts from the related field. The item content validity index (I-CVI) and scale content validity index (S-CVI) were used to measure the degree of relevance of the module. The item content validity index (I-CVI) and scale content validity index (S-CVI) scored 1.00 which showed an excellent degree of relevance of the Chance2Act health intervention module. Feedbacks and recommendations provided valuable insights into the experts' perceptions of the module's potential to be implemented in the future. This study's findings suggest that the Chance2Act health intervention module shows a promise as a validated tool for promoting behaviour change among T2D adults with obesity. The validated module can serve as valuable resource for healthcare professionals, health educators, and policymakers seeking evidence-based interventions to address obesity among T2D adults. Further research is warranted to assess the module's face validity and effectiveness among the target population.

PP2.029 Coping strategies among nurses in the Ministry of Health Malaysia: how are they related with burnout?

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Different coping strategies cast varying effects on personal emotions and the development of burnout. This study aimed to determine the type of coping strategies among nurses in the Ministry of Health (MOH) and its relationship with burnout. 2,418 MOH nurses who were recruited via two-stage stratified cluster sampling between August to November 2019 answered self-administered questionnaires that incorporated three burnout domains (emotional exhaustion, EE; depersonalisation, DP; personal accomplishment, PA) under Maslach Burnout Inventory for Human Services (MBI-HSS) and three main coping strategies (problem-focused, emotion-focused, dysfunctional) under Brief COPE. Complex sampling analysis was applied. One in four (24.4%) nurses experienced burnout, with 41.6% reporting low PA, followed by 23.9% and 4.5% with high EE and high DP respectively. The most commonly applied coping strategies were religion (mean \pm SD = 7.11 \pm 1.27) and positive reframing (mean \pm SD = 6.19 \pm 1.36) while the least used strategies were behavioural disengagement (mean \pm SD = 2.95 \pm 1.19) and substance use (mean \pm SD = 2.07 \pm 0.49) under dysfunctional coping. Problem-focused strategies were positively related to high PA. The use of religion as an emotion-focused coping strategy was higher among nurses without burnout. It was also positively correlated with high PA (B=1.38) and low DP (B= -0.29). Dysfunctional coping including behavioural disengagement, self-blame, self-distraction, and venting was more common among nurses with burnout. These strategies were also positively correlated with high EE and DP. Interventions that limit the use of dysfunctional coping is vital while positive coping strategies such as active coping and positive reframing must be inculcated to mitigate burnout among at-risk nurses

PP2.030 Cyberbullying perpetrator and its associated factors among school-going adolescent in Malaysia

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Cyberbullying is becoming a significant issue in schools because of the development of digital communication technology. This study aims to determine the associated factors of cyberbullying perpetrators among school-going adolescents in Malaysia. Data was obtained from the National Health and Morbidity Survey 2022, a multi-stage stratified cross-sectional study which was conducted among school-going adolescents aged 13 to 17 years old. A total of 33,523 adolescents participated in this study by answering the self-administered questionnaire. The perpetration of cyberbullying was defined as bullying or harassment through the internet, cell phones, or other electronic devices a few times within a year. Complex sample design analysis was used to estimate the prevalence and complex sampling multivariable logistic regression was used to determine factors associated with cyberbullying perpetration. All analysis was done using SPSS version 26.0. The prevalence of cyberbullying perpetration among school-going adolescents in Malaysia was 18.3% (95% CI: 17.47, 19.09). Multiple logistic regression analysis showed that male adolescents, anxiety, depression, having no close friend, being involved in physical fights, experiencing physical and verbal abuse, being bullied, truancy, a lack of peer support, being smokers, alcohol drinkers, a lack of parental connectedness, and a lack of parental privacy were significantly associated with cyberbullying perpetration. In conclusion, one in five school-going adolescents in Malaysia was involved in cyberbullying perpetration activities. Therefore, awareness programmes for cyberbullying should now focus on the perpetrator, in order to reduce the prevalence of cyberbullying activities among school-going adolescents.

PP2.032 Dietary behaviour and depression among adolescents in Malaysia

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Depression is increasingly common and poses a significant public health concern. Limited evidence exists on the link between dietary behaviours and depression. This study aimed to investigate the association between dietary behaviours and depression in school-going adolescents. The study used data from the Adolescent Health Survey 2022, a nationwide survey of school-going adolescents aged 13-17. A total of 33,523 participants from 239 schools were included. Depression was measured using the Patient Health Questionnaire (PHQ-9), with a score of 10 or higher indicating depression. Dietary behaviours were assessed using a standard questionnaire. Descriptive and complex sample logistic regression analyses were performed using SPSS version 26.0. The overall prevalence of depression was 26.9%, with female adolescents and those in higher grades being more likely to experience it. Chinese and Indian adolescents had lower odds of depression compared to Malays. Positive dietary habits, such as consuming fruits, were negatively associated with depression (AOR: 0.69 [95% CI: 0.65, 0.74]). Conversely, unhealthy behaviours like fast-food consumption (AOR: 1.73 [95% CI: 1.55, 1.93]) and intake of carbonated soft drinks (AOR: 1.59 [95% CI: 1.48, 1.70]) were positively associated with depression. The study discovered substantial cross-sectional evidence that healthy dietary behaviours, such as consuming fruits were associated with lower depression. On the other hand, unhealthy behaviours such as fast-food and carbonated soft drinks consumption were associated with higher depression. Effective public health programs should be developed to prioritize mental health and encourage healthy eating habits in adolescents.



PP2.033 Dietary intakes among school adolescents in Terengganu, Malaysia: are there differences between gender?

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Malaysia is witnessing a remarkable nutrition transition nationwide, and the diets of school-aged children may be amongst those most affected. However, studies examining food consumption patterns and nutrient adequacy, particularly in Terengganu, are limited. Therefore, this study aimed to evaluate the dietary intake of school adolescents in Terengganu and assess differences between gender. A school-based, cross-sectional study involving 1,404 school adolescents was conducted in Terengganu, Malaysia in 2015. Dietary intake was assessed using the validated food frequency questionnaire (FFQ) method. Estimated food group and nutrient intakes were compared to dietary recommendations and age-specific recommended nutrient intake (RNI) and Malaysia Dietary Guidelines (MDG) for Children and Adolescents. The mean intake of energy, carbohydrate, protein, fat, and fibre was 2383 kcal, 328.9 g, 97.5 g, 75.3 g and 11.1 g respectively. Boys had a significantly higher intake of energy, carbohydrate, protein, and fat as compared to girls ($p < 0.001$). Compared to girls, boys had a significantly higher intake of food groups of grains, cereals, and tubers; meat and poultry; and fish was 6.13 ± 3.47 servings/day, 1.62 ± 1.55 servings/day, 1.95 ± 2.02 servings/day; $p < 0.05$ respectively. Whilst sodium intake among boys and girls exceeded the recommendation (RNI < 2000 mg/day) by 122.9% and 100.3%, respectively. Overall, calcium and protein intake for both boys and girls were below the Malaysian RNI. Nutritional adequacy among school adolescents in Terengganu was, in general, adequate, although it is necessary to analyse the implications of excessive intakes of energy and sodium intake, together with inadequate calcium intake. Nutrition interventions promoting appropriate dietary intake among school adolescents are recommended.

PP2.034 Disability-adjusted life years (DALYs) due to COVID-19 in Malaysia in calendar year 2022

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This study is part of a continued effort to estimate the annual burden (as measured by disability-adjusted life years or DALYs) of COVID-19 to determine potential losses averted by vaccination and other mitigation efforts. Data on individual COVID-19 deaths and daily case counts in Malaysia during 2022 were obtained from the Ministry of Health. DALYs are the sum of years of life lost to premature mortality (YLL) and years lived with disability (YLD). YLL were derived by multiplying the number of deaths in each age-group by the age- and sex-conditional life expectancy as defined in the national life table. To calculate YLD, person-years for each COVID-19 category (derived from the sum of active cases daily scaled by a factor of $1/(365.25)$ to reflect the contribution of individual days to a complete year, since DALYs use year as the unit of time) were multiplied by the corresponding disability weight (representing severity; scale of 0 to 1 with 0 indicating no disability) for that category. In 2022, there were just over 87,000 DALYs lost due to death or illness caused by COVID-19 in Malaysia, compared to nearly 700,000 DALYs in 2021. This corresponds to a per-capita burden of 250 DALYs per 100,000 people. Similar to 2021, the mortality component (YLL) made up the overwhelming majority of DALYs (99.5%), albeit with a slightly higher proportion of YLD in 2022. These DALY estimates highlight that the COVID-19 pandemic continues to cause a substantial burden on the Malaysian population, although the burden has reduced significantly compared to previous years.

PP2.035 Do quality of life mediate the relationship between smoking and mortality in older people?

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Previous research has established a link between smoking and mortality, but the underlying mechanisms are not fully known. This study aimed to explore the connection between smoking and mortality, specifically investigating whether quality of life (QOL) plays a mediating role in this relationship. The study included 7,117 Malaysian adults aged 50 years and older, drawn from the National Health Morbidity Survey 2018. The data was matched with information from the National Registration Department (NRD) for their mortality status over a period of four years. QOL for older adults was assessed using a validated questionnaire, and smoking status was categorized as "ever smoked" or "non-smoker" based on self-reported information. Age and physical activity were also included to control for potential confounding effects. Mediation analysis using the bootstrapping method was conducted, using the R package "mediation". Preliminary analyses showed a significant association between smoking and mortality risk, with smokers having the higher mortality rates compared to non-smokers. QOL was negatively correlated with smoking status, suggesting that smokers experienced lower quality of life compared to non-smokers. Further analysis using mediation analysis does support the idea that quality of life mediates the relationship between smoking and mortality ($p < 0.05$). Our study emphasizes the importance of comprehensive efforts to improve the quality of life for smokers. Such interventions and policies can have a meaningful impact on public health and reducing mortality. These discoveries help us better understand the intricate relationship between smoking and mortality, and they provide valuable suggestions for future research and targeted health improvement programs.

PP2.036 Does awareness of Malaysian healthy eating plate influence the fruit and vegetables intake among the adult population with diabetes mellitus in Malaysia?

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The Malaysian Healthy Plate campaign promotes the significance of increasing fruits and vegetables (FV) consumption as part of a healthy diet, where diet rich in FV is associated with reduction in fasting blood sugar and risk of diabetes mellitus (DM). Little data about the relationship between awareness of health eating plate and adequate FV daily intake among Malaysian adults is available. Our study aimed to determine the association between adequate FV intake and awareness about the healthy eating plate among the adult population with diabetes mellitus in Malaysia. Data from 1,365 participants with known DM were collected during the National Health and Morbidity Survey 2019. The data collected were participants' sociodemographic characteristics, lifestyle, FV intake, and awareness of healthy eating plate. Multiple variable logistic regression analysis was applied to determine the association between adequacy of FV intake and awareness about healthy eating plate. Only 2.3% and 22.4% of participants consumed enough FV and aware of the healthy eating plate, respectively. The odds of having adequate FV intake for those who were aware of the healthy eating plate, compared to those who were unaware was 3.59 (95% CI: 1.16, 7.99), while adjusting for sociodemographic and lifestyle factors. There was a significant association between the adequacy of FV intake and awareness of the healthy eating plate. FV consumption among adults with DM remains unsatisfactory further emphasize the needs to raise the awareness of healthy eating plate that will ensure daily adequate FV intake that should be targeted among the adults with DM in Malaysia.



PP2.037 Drinking water system in Klang Valley, Malaysia: any resistant bacteria?

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Drinking safe water is crucial for health, while antimicrobial resistance is a global concern due to the failure of antimicrobial drugs. This study aimed to investigate antibiotic-resistant bacteria (ARB) and antibiotic residues in a selected drinking water treatment plant (DWTP) in Klang Valley, Malaysia. In this cross-sectional study, sampled water from the Intake Station (river water), Service Reservoir Outlet Station (post-treatment), and Distribution System Sampling Station (main tap) were either diluted or membrane filtered. Bacteria were cultivated on Reasoner's agar in triplicates. Resistance rates were calculated from bacterial growth on agar with and without antibiotics. Bacterial isolates were subjected to 16S PCR and Kirby-Bauer test. The presence of antibiotics was quantified using Liquid Chromatography-Mass Spectrometry. Heterotrophic bacteria from the river (1.87×10^4 cfu/mL), post-treatment (5.0×10^{-3} cfu/mL) and distribution tap (5.0×10^{-3} cfu/mL) were recorded. Of 88 isolates obtained, 30 isolates were selected based on colony morphology and further analysed. From the analysed samples, 10% were *Enterobacter* spp., *Klebsiella pneumoniae* (10%) and 80% were other species including *Bacillus* sp., *Klebsiella* sp., *Pseudomonas* sp., *Pantoea* sp., *Chromobacterium* sp., *Acinetobacter* sp., *Aeromonas* sp., *Chryseobacterium* sp., and *Comamonas aquatica*. Of these, 96.6% (n=29) were resistant to amoxicillin, vancomycin (66.7%), sulfamethoxazole (23.4%) and tetracycline (10%), where 23.3% (n=7) were multidrug-resistant. Six of the ARB were resistant to three antibiotics and one isolate was resistant to four antibiotics. Resistance rates ranged from 2.4% to 75%. No antibiotic residues were detected in all samples. The findings suggest that untreated water could serve as a significant source for exposure and dissemination of ARB in the environment. However, efficient DWTP to treat microbial contaminants and boiling the water prior to consumption could reduce the risks of transmission from drinking water.

PP2.038 E-cigarette use among adolescents in Malaysia: findings from a national survey

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E-cigarettes are battery-powered devices that allow users to inhale nicotine into their lungs through vapour. The use of e-cigarettes, especially among adolescents, has become increasingly prevalent. In Malaysia, the prevalence of e-cigarette uses among adolescents aged 13 to 17 years was 9.8% in 2017. This study would determine the latest prevalence of e-cigarette use and the associated factors among adolescents in Malaysia. The study utilised data from a national survey on adolescents, i.e., the National Health and Morbidity Survey (NHMS) 2022. The survey used a two-stage stratified sampling design to select adolescents aged 13 to 17 from secondary schools in Malaysia. The survey used a structured questionnaire that was adapted and validated from the Global Youth Tobacco Survey Questionnaire. The data was analysed using complex sample design analysis. A total of 240 schools were selected, and about 34,000 students participated in the survey. The prevalence of e-cigarette use was 14.9% (95% CI: 13.7, 16.1). The adjusted odds ratio (aOR) of e-cigarette use was 56.3 (95% CI: 46.76, 67.77) in adolescents who smoke, 3.8 (95% CI: 3.37, 4.30) in males, 3.7 (95% CI: 3.02, 4.57) in Malay compared to Chinese, 1.6 (95% CI: 1.42, 1.89), and 1.3 (95% CI: 1.16, 1.49) among students with parents who use e-cigarette and who smoke, respectively. The study shows that the prevalence of e-cigarette use among adolescents in Malaysia has significantly increased in the past 5 years. Anti-smoking measures among adolescents need to be strengthened to include various types of tobacco products, especially e-cigarettes.

PP2.039 Effects cannabis for medical use: evidence to inform policy

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Cannabis or cannabinoid is a genus of flowering plant whose most well-known species include sativa, indica, and ruderalis. The relative proportions of cannabis varieties in each strain determine psychoactive potency that have been used for medical and religious purpose. Repeated cannabis use has been associated with side effects, cognitive alterations, mental health, and others. This study was conducted to systematically evaluate the health benefits and harms of the cannabis for various medical conditions, its implications for consumers and to inform policy and practice. We searched databases: PubMed, CENTRAL and EMBASE and included studies measured the effect of cannabis for medical use. We performed meta-analyses and used GRADE to assess the certainty of evidence. We included 13 studies that evaluated cannabis for medical used. One trial each reported a statistically significant differences in spasticity severity measured using the modified Ashworth scale (MAS) (MD -2.53, 95% CI: -3.95 to -1.11, p=0.0005; 60 participants) and spasticity using the Numeric Rating Scale (NRS) (MD -2.32, 95% CI: -3.94 to -0.70, p=0.005; 32 participants) between multiple sclerosis (MS) patients receiving cannabis treatment and placebo respectively. One trial each reported a statistically significant difference is observed in the improvement of appetite between cancer patients receiving cannabis treatment and placebo (MD 9.80, 95% CI: 0.38 to 19.22, p=0.04; 21 participants). It is possible the harms of cannabis-based medicines may outweigh benefits. No firm conclusion can be made to inform practice.

PP2.040 Description of COVID-19 Beta outbreak in Malaysia

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The Beta strain of COVID-19 (variant B.1.35) was declared a Variant of Concern (VOC) in July 2020. The emergence of the Beta strain in Malaysia added another layer of complexity to the COVID-19 outbreak. We aim to describe an account of COVID-19 cases and deaths during the Beta outbreak in Malaysia. Data on COVID-19 cases and deaths in Malaysia from EpiWeek 37/2020 to EpiWeek 13/2021 (duration of the COVID-19 Beta outbreak) was sourced from the official MOH COVID-19 GitHub repository and website. The data were aggregated by epidemiological week and the following epidemiological indicators determined: Overall and gender-specific weekly total cases, incidence rate, deaths, death rate and case fatality rate (CFR). During the Beta outbreak, a total of 333,488 (7.48 %) COVID-19 cases were reported comprised of 224,086 (67.19%) and 109,402 (32.81%) males and females respectively (male-to-female case ratio of 2.1). The gender-specific incidence rates per 1,000 population were 13.37 and 6.91 in males and females. The epidemiological curve showed cases gradually increased over 20 weeks from 471 at Epi Wk 37/2020 and peaked at Epi Wk 4/2021 (n=29,206) and decrease over 8 weeks to 2,243 cases. A total of 1,132 deaths (3.18%) occurred, 732 (64.7%) male and 400 (35.3%) female, ratio of male to female deaths was 1.8. The death rates were 0.04 and 0.03 in males and females respectively. CFR in males and females were 0.33% and 0.37%, respectively. Males recorded a higher number of COVID-19 cases, incident rates, deaths, death rate compared to females. Despite the Beta strain being virulent, the outbreak managed to be contained by public health and social measure (PHSM).



PP2.041 Estimating the COVID-19 mortality burden in Malaysia in 2022

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Measuring years of life lost (YLL) owing to premature death from a disease offers a more appropriate metric than absolute death counts for measuring the mortality burden of a disease. This study is part of a continued effort to estimate the burden of mortality attributable to COVID-19 by measuring YLL to COVID-19 in Malaysia in 2022. Data on individual COVID-19 deaths in Malaysia that occurred in 2022 were obtained from the Ministry of Health's GitHub repository. We calculated YLL attributable to COVID-19 using life expectancy data from the national life table for 2022 (estimates) published by the Department of Statistics Malaysia (DOSM) and compared the burden of COVID-19 relative to deaths from other leading causes of disease and injury in the country as reported by the Malaysian Burden of Disease and Injury Study 2017 (MBOD 2017). In 2022, males lost 49,121 YLL and females lost 37,470 YLL (corresponding to 16.1 and 16.6 years lost per person who died of COVID-19, respectively). The state of Kedah saw the highest YLL rate of 427.8 years per 100,000 people. When compared to MBOD 2017, YLL attributable to COVID-19 ranked 8th among the leading causes of fatal burden in the country during pre-pandemic times. The mortality burden from COVID-19 in 2022 fell by more than seven-fold compared to 2021—a likely reflection of the success of the National COVID-19 Immunisation Programme, which served to prevent severe illness (and hence death, thus drastically reducing YLL), protect vulnerable populations, and expedite the end of the pandemic.

PP2.042 Estimating years of life lost: understanding the burden of disease in Malaysia

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Years of Life Lost (YLL) is a measure used to evaluate the impact of disease on population health. Monitoring mortality rates and analysing YLL helps us identify health trends and allocate healthcare resources effectively. Despite the limited numbers of large-scale studies on YLL in Malaysia, our study aimed to estimate YLL caused by diseases in Malaysia. This cross-sectional study utilised mortality data from 2018, obtained from the Department of Statistics Malaysia. Mortality data included information on cause of death, age, and sex. YLL was calculated by summing the numbers of deaths for 113 specific diseases and multiplying it by the remaining life expectancy for each corresponding age and sex group. The findings revealed a total of 3.5 million YLL in Malaysia in 2018. Older adults had a higher mortality burden than younger individuals, and males had a higher mortality burden than females. Non-communicable diseases (NCD) constituted 72% of the total YLL. The top five diseases contributing to YLL were ischaemic heart disease, lower respiratory infections, road traffic injuries, cerebrovascular disease, and diabetes mellitus. Ischaemic heart disease emerged as the leading cause of premature mortality, emphasising the importance of promoting cardiovascular health, early detection initiatives, and lifestyle changes. Addressing social factors and health challenges like road traffic injuries and lower respiratory infections are crucial for reducing YLL. By prioritising prevention, improving healthcare access, and addressing social determinants, these strategies contribute to the reduction disease burden and improvement of overall health outcomes.

PP2.043 Exploring factors associated with speech delay among children below 5 years old in Malaysia

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The presence of speech delay in children can have a notable impact on their communication and overall development. This study aimed to identify the prevalence of speech delay and its associated factors among children below 5 years old in Malaysia. Data from a cross sectional survey, National Health and Morbidity Survey 2022: Maternal & Child Health was utilised for this study. This study used a two-stage stratified random sampling involving 15,241 children aged 6-59 months old across Malaysia. Speech delay was determined using Denver Development Screening Chart, assessed by trained nurses. Analyses were carried out using complex sample multiple logistic regression to determine the factors contributed to speech delay in children below 5 years in Malaysia. The overall prevalence of speech delay was 2.7% with estimated population of 56,452 children in Malaysia. Multiple logistic regression analysis showed that boys (aOR: 1.74; 95% CI: 1.35-2.32), children aged 24-35 months (aOR: 6.71; 95% CI: 3.40-13.22), stunting (aOR: 4.37; 95% CI: 1.68-11.40) and low birth weight (aOR: 1.58; 95% CI: 1.11-2.24) were significantly associated with speech delay among children in Malaysia. No significant associations were found in ethnicity, urban or rural strata, citizenship, and total household income. The high prevalence of speech delay among Malaysian children warrants much attention. Therefore, increasing parental education and awareness on improving nutritional status that starts from the womb until childhood are important in reducing low birth weight and stunting, ultimately contributing to a potential reduction in speech delay.

PP2.046 Familial factors associated with alcohol use among adolescents in Malaysia: findings from Adolescent Health Survey 2022

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Alcohol use among adolescents and young adults has become widespread in recent decades. Adolescents raised in a supportive, affectionate, and accepting home environment are less likely to become socially deviant. This study aims to establish potentially important familial factors associated with alcohol use among school-going adolescents in Malaysia. The study utilised data from the nationwide cross-sectional Adolescent Health Survey 2022, with 33,523 school-going adolescents participating in this survey. Descriptive and complex sample logistic regression analyses were performed using SPSS version 26.0. This self-administered survey used the Global School-based Student Health Survey (GSHS) core questionnaire modules and core-expanded questions. The prevalence of current alcohol use among school-going adolescents in Malaysia is 7.4% (95% CI: 6.3, 8.7). Multiple logistic regression revealed that adolescents who are male [aOR: 1.43 (95% CI: 1.23, 1.68)], aged 17 years old [aOR: 2.00 (95% CI: 1.59, 2.52)], Chinese ethnic [aOR: 6.96 (95% CI: 5.02, 9.64)], current drug users [aOR: 2.78 (95% CI: 1.99, 3.86)], who was physically abused at home [aOR: 1.90 (95% CI: 1.51, 2.40)], sometimes or rarely hungry at home [aOR: 1.20 (95% CI: 1.02, 1.42)], verbally abused at home [aOR: 1.37 (95% CI: 1.17, 1.59)], have at least one parent who drinks alcohol [aOR: 8.94 (95% CI: 6.96, 11.48)], and have insufficient parental bonding [aOR: 1.26 (95% CI: 1.06, 1.48)], were significantly associated with alcohol current use. Multiple familial factors associated with alcohol use among adolescents suggested that prevention of alcohol use should begin at home. Adolescence is the most critical period for preventing alcohol consumption. Understanding the complex familial relationship is essential for prevention programs and policymakers.



P2.048 Gender differences in factors associated with depression symptoms among older people in Malaysia: a nationwide survey

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Gender disparity in depression between older persons was observed in the developed countries. However, research on this particular topic was limited in Malaysia. Therefore, the study investigated gender differences in depression and factors associated with depressive symptoms in female and male of older people in Malaysia. This study was conducted using a two-stage stratified random sampling design. In total, 3,977 older adults aged ≥ 60 years responded to the survey. Depression was identified using a validated Malay version of the Geriatric Depression Scale (M-GDS-14), with those scored ≥ 6 categorized as having depression. Data was analysed via a statistical software to tabulate results on descriptive, bivariate, and multivariable logistic regression. The prevalence of depression symptoms among females was 11.7% (95% CI: 9.4, 14.5) and males was 10.7% (95% CI: 8.9, 13.0). Multivariable logistic regression showed factors associated with depression among females were those with hypertension (AOR: 1.75; 95% CI: 1.11, 2.75), hypercholesterolaemia (AOR: 1.52; 95% CI: 1.04, 2.21), individual with income less than RM 1,000 (AOR: 3.19; 95% CI: 1.11, 9.13), unemployed (AOR: 3.08; 95% CI: 1.78, 5.33 and being a housewife (AOR: 2.39, 95% CI: 1.14, 5.00). Among males, depression symptoms were associated those with income less than RM 1,000 (AOR: 2.42; 95% CI: 1.03, 5.69) and currently not married (AOR: 1.95; 95% CI: 1.10, 3.47). This study found that there was a difference in the factor associated with depressive symptoms among women and men of older age in Malaysia. This suggests the need for community-based interventions for effective management of high-risk older adults with chronic diseases.

PP2.049 Gestational urinary perfluoroalkyls substances (PFAS) and urinary bisphenol A (BPA): any detrimental effects to pregnancy and newborn

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In human, PFAS were detected in human umbilical cord and able to cross the placenta. Exposure to PFAS have been associated with preeclampsia, birth defects and increased of uric acid levels. In Malaysia, it is not well understood whether PFAS and BPA pollutant are affecting pregnancy outcomes. This was a prospective cross-sectional study of 123 pregnant women attending antenatal clinic HASA. Data was collected from September 2021 to May 2022. Pregnant patients were clerked during their antenatal appointment in their 3rd trimester. Urine samples were collected for PFAS and BPA analysis. There was no PFAS pollutant found. The absence of PFAS in urine was retested using HPLC technique. Incidentally discovered BPA pollutant in urine. Due to budget limitation, only 84 urine samples managed to be analysed for BPA, which ALL urine were found to contain BPA pollutant and its level ranged from 4.42 ng/mL to 82.13ng/ml which is significantly high. Our study revealed that urinary BPA level was found higher in mother who gave birth preterm and with higher body mass index (BMI) ($p < 0.001$). Majority of babies who need NICU admission were born to mothers with higher urinary BPA level (p value < 0.001) mainly due to prematurity. This is the only published study that completely failed to detect or measure any form of PFAS. It is believed that the absence of PFAS pollutant in maternal urine in Klang Valley is due to the ability biodegradation of PFAS pollutant by Filamentous Fungi – a sewage treatment plant under Indah Water Kosortium (IWK).

PP2.050 Healthcare workers' (HCWs) perspectives during the first dose coronavirus disease 2019 (COVID-19) vaccine outreach programme in the Sik District of Kedah: A qualitative study

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Targeted primary care outreach is one of the strategies to rapidly increase COVID-19 immunization coverage among rural residents, however during the pandemic COVID-19, it was executed within a short period of time. This may cause multiple reactions from the HCWs themselves. The study aimed to explore the HCWs' perspectives on the recent Sik COVID-19 vaccination outreach programme. The programme was conducted from October 2021 to January 2022. A post-programme evaluation form was created by the Sik District Health Office team and a phenomenology study design was utilised to explore HCWs' perspective. It was a voluntary evaluation form and anonymous in nature, however the involved HCWs needed to submit the form to the district health office. The form was created via an open-ended questionnaire in Malay language in exploring the HCWs' field observation, experience and opinion related to the outreach programme. A thematic analysis was conducted, and thematic data saturation was considered during the analysis. A total of 39 end-of-programme evaluation forms were analysed and three main themes derived from the data. The themes were: 1) difficult accessway was prominent; 2) structural and attitudinal challenges during the outreach programme and 3) an organised outreach programme benefited all. This study showed that structural-related challenges was prominent in rural areas such as Sik district, and the outreach team must be adequately prepared and equipped to optimize the programme outcome. A proper training in counselling is vital for the outreach team to manage attitudinal-related challenges, in particularly resident with vaccine hesitancy attitude.

PP2.051 Heavy metals in canned food sold in Malaysian market

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Canned food is among popular food sources and has been receiving great interest due to its easy handling and storage. However, there is a potential of migration of heavy metals from the package to the food which may be harmful to human health. This study aims to determine selected heavy metals [Stanum (Sn), cadmium (Cd), lead (Pb), and arsenic (As)] in canned food sold in Malaysian market. A total of 218 canned food including meat and poultry (n=28), fruits (n=31), vegetables (n=35), seafood (n=39), sauces (n=29), soup (n= 28) and dairy products (n=28) from 14 states in Peninsular Malaysia were determined by acid digestion and inductively coupled plasma-mass spectrometry (ICP-MS). Sn, Cd, As, and Pb were detected in 96.8%, 80.7%, 93.1% and 64.2% canned food samples respectively. The metals concentrations were in the order of Sn > As > Cd > Pb. The concentrations of canned food ranged from 0.0020–937.1339 mg/kg wet weight (ww) for Sn, 0.0061–27.0361 mg/kg ww for As, 0.0005–2.7255 mg/kg ww for Cd, and 0.0023–0.7362 mg/kg ww for Pb. The results of heavy metals except for Sn were compared with the Malaysian Food Regulations 1985. A total of 35 canned seafood samples (16.1%) exceeded the 1 mg/kg limit for As. Meanwhile, concentrations of Sn in canned food were compared with Codex Alimentarius and 30 canned fruits, vegetables and sauce exceeded the 250 mg/kg stipulated in the standard. The exceedance of Sn and As in canned food beyond the limit warrant consumption of the product with caution.



PP2.052 HIV knowledge and risky sexual behaviour among adolescents in Malaysia: findings from a National School Health Survey

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HIV knowledge is known to be related with a positive sexual behaviour. Although, the relationship between HIV knowledge and risky sexual behaviour among adolescents is complex and could be positive or negative. This study aims to determine the prevalence of HIV knowledge and sexual behaviours, as well as the relationship between HIV knowledge and sexual behaviours among school adolescents. This study used data from the National Health and Morbidity Survey (NHMS) 2022, a nationwide cross-sectional study on secondary school adolescents. Data on HIV knowledge and sexual behaviours were collected using a validated self-administered questionnaire, identical with the tool used in NHMS 2012 and 2017. Cross-tabulation was done through complex sample analyses using IBM SPSS version 26. From 33,523 adolescents who participated in the survey, 1.3% had adequate HIV knowledge while 7.6% ever had a risky sexual behaviour. Out of the adolescents who had adequate HIV knowledge, 97.6% (95% CI: 84.11, 99.69) did not use condoms while 9.6% (95% CI: 2.70, 28.94) had more than one sexual partner. On the other hand, for those without adequate HIV knowledge, 88.1% (95% CI: 86.33, 89.72) did not use condoms while 10.7% (95% CI: 9.16, 12.37) had more than one sexual partner. When compared, results were not statistically significant. Malaysian adolescents with adequate knowledge on HIV did not show a better sexual behaviour compared to those without it. This study provides evidence for future studies to investigate other factors related to sexual behaviour among school adolescents in Malaysia.

PP2.054 Impact of medical nutrition therapy on HbA1c reduction in Malaysia primary healthcare clinics

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Medical nutrition therapy (MNT) is a cornerstone of diabetes management that entails tailored dietary interventions by qualified dietitians. The role of MNT in lowering HbA1c levels has been thoroughly researched, and data supports its efficacy in improving glycemic control. This study aimed to evaluate the effectiveness of MNT delivery to diabetic patients in primary healthcare clinics in Malaysia. This retrospective cohort study was conducted using data from 2016 to 2019. The data were obtained from a quality indicator project in primary health care clinics that met the inclusion criteria. HbA1c levels were measured both pre- and post-MNT consultation within a 6-month period. Data were analysed using IBM SPSS for descriptive and comparative statistics including t-test. A total of 1,948 diabetes patients (mean age of 56.6 years) participated in the study; with 67.0% females and 76.4% Malays. The mean HbA1c level was significantly reduced by 2.60 ± 1.72 ($p < 0.001$), from the pre-consultation period (10.90 ± 1.98) to the post-consultation period (8.30 ± 1.76). Male patients showed significantly higher reduction of HbA1c (2.81 ± 1.88) compared to females (2.50 ± 1.62) ($p < 0.01$). These findings suggest that MNT delivered by dietitians have a positive impact on glycemic control in diabetes patients. The significant reduction in HbA1c levels observed after consultation highlights the effectiveness of dietary interventions in managing diabetes. Further research is warranted to explore the specific strategies employed during these consultations and to assess the long-term sustainability of MNT in glycemic control.

PP2.055 Improving physical activity levels among individuals with type 2 diabetes mellitus: findings from a cross-sectional study in Kuala Lumpur

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Physical activity has been linked to numerous benefits for individuals with Type 2 Diabetes Mellitus (T2DM), including improved glycaemic control, reduced diabetes-related complications, decreased mortality, and enhanced quality of life. In this cross-sectional study conducted in Kuala Lumpur, we aimed to assess the physical activity levels of community-dwelling adults with T2DM. A total of 264 participants were included in the study, and their physical activity levels were evaluated. Majority of physical activity reported by participants consisted of low-intensity activities, predominantly walking. Approximately 76% of participants engaged in regular walking, 53% reported engaging in moderate-intensity activities, and 13% reported vigorous-intensity activities. Based on these findings, 107 participants (41%) were classified as inactive. Our findings revealed an association between physical inactivity and both employment status and diabetes duration. Participants with longer durations of diabetes were more likely to be inactive (OR=1.05; 95%CI=1.00 – 1.10, $p < 0.05$), while those who were actively employed were less likely to be inactive (OR=0.49; 95%CI=0.28 – 0.86, $p < 0.05$). However, our study did not demonstrate an association between physical activity levels and other demographic or health-related factors. These results highlight the need for interventions and strategies to improve physical activity levels among individuals with T2DM, particularly those with longer durations of the disease. Encouraging regular physical activity, focusing on varied intensities, and targeting individuals who are unemployed or less active occupationally may contribute to addressing physical inactivity in this population. Further research is warranted to explore additional factors that may influence physical activity levels among individuals with T2DM in different settings.

PP2.056 IMSURE active surveillance: adverse event following immunization (AEFI) COVID-19 among single dose vaccine recipients in Malaysia

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Different levels of protection against COVID-19 infection are provided to vaccine recipients through the immunisation programme. IMSURE, a surveillance programme launched in collaboration with the Malaysia's COVID-19 National Immunisation Programme, is responsible to monitor the level of immunity and the occurrence of COVID-19 after vaccination. This study aims to describe the AEFI among single dose vaccine recipients in Malaysia. A prospective cohort design was used in this sentinel surveillance study to monitor and follow-up on selected Convidecia vaccine (single-dose vaccine) recipients in Selangor, Sabah, and Kedah. AEFI was recorded using a questionnaire 14 days after complete dose. Descriptive analysis was done to describe the event of AEFI, and the characteristics were compared using the Chi-Square test. The study assessed 562 recipients, and 166 (29.5%) of them reported having AEFI. Most reported AEFI were systemic symptoms (79.5%) such as fever, dizziness, and headache, followed by localised symptoms (20.5%) mostly, pain at the injection site. No severe AEFI was documented during this study. There were significant associations between ethnicity ($\chi^2=13.83$, $p=0.01$) and comorbidity ($\chi^2 =0.02$, $p=0.02$) with AEFI among Convidecia recipients. This finding also in line with NPRAADR/AEFI report which stated that the majority (93.0%) of reported AEFI were non-serious. As conclusion, this study demonstrated that Convidecia vaccine has several mild symptoms of AEFI and suggested that the benefit-to-risk ratio of this vaccine remains favourable.



PP2.057 Incidence of acute respiratory infection and its treatment among Malaysian children under five between 2016 and 2022

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Acute Respiratory Infection (ARI) is a primary cause of morbidity and mortality among children under the age of five worldwide, including Malaysia. Nonetheless, there is a scarcity of current Malaysian data. Therefore, this study aims to compare the incidence of ARI and treatment received by Malaysian children under five between 2016 and 2022. Data was obtained from two cross-sectional population-based surveys conducted in 2016 and 2022 involving 15,188 and 17,176 children under the age of five, respectively. Trained research assistants conduct data collection through face-to-face method. The study questionnaire was adapted from the WHO Multiple Indicator Cluster Survey. ARI is defined as children who have cough and fast breathing or difficulty breathing in the last two weeks as perceived by their mother or caretaker. Descriptive analyses were conducted using IBM SPSS Statistics (Version 25) taking into consideration the complex survey design. The incidence of children who had symptoms of ARI was 1.4% in 2022, slightly increased from 1.3% in 2016. Among children with ARI, 99.5% received treatment from a health facility in 2022, showcasing a marked increase from 2016 (88.9%). Among children with ARI, a higher percentage (74.6%) received antibiotics in 2022, indicating an increase compared to 2016 (62.8%). In conclusion, the incidence of ARI among Malaysian children has increased slightly since 2016, along with an increased usage of antibiotics. Health care providers should carefully evaluate each child with ARI before prescribing antibiotics, considering the child's medical history, symptoms, and other factors according to the 3rd National Antimicrobial Guidelines Malaysia.

PP2.059 Investigating the prevalence and causes of mothers not seeking dental care for their children: findings from National Health Morbidity Survey 2022

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Regular dental examination and treatment are essential for children's oral health. However, there are mothers who do not bring their children for dental care, leading to potential dental issues like dental problem undetected and delayed intervention. This study aimed to determine the prevalence of mothers not bringing their children for dental examination and treatment and the reasons behind this behaviour using data from the National Health and Morbidity Survey (NHMS) 2022, Malaysia. Data of mothers with children under 5 years of age across Malaysia were analysed using complex sampling method. Prevalence rates were calculated along with confidence intervals. The reasons of not bringing children for dental treatment were reported as unweighted counts and percentages. The prevalence of mothers not bringing their child for dental examination and treatment was found to be 60.8% (95% CI: 58.7–62.7). The study findings revealed that the primary reasons reported was the belief that their child had no dental problem (58.7%) followed by the perception that their child was too young for treatment (22.6%), the child's fear of dental treatment (3.9%), concerns related to the COVID-19 pandemic (3.6%), the distance to the dental clinic being too far (1.7%) and the belief that dental treatment for milk teeth was not important (1.0%). In conclusion, this study provides insights into the prevalence and reasons why mothers do not bring their children for dental examination and treatment in Malaysia. By addressing these reasons, policymakers and healthcare professionals can promote better oral health practices and improve dental care utilization among young children.

PP2.060 Is the super skills for life (SSL) program a suitable mental health intervention in female detention centres? a qualitative study

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In Malaysia, studies reveal higher rates of mental health issues amongst institutionalised youths compared to non-institutionalised youths. The SSL Program, a locally adapted mental health intervention was deployed as an interventional study to evaluate its effectiveness in improving the mental wellbeing of institutionalized young females. This qualitative study was the final phase of a dual phase study to explore the practicality of the implementation and content of the intervention from the perspective of the young female participants. A semi-structured interview approach was employed for this qualitative study. Purposive sampling was done to form focus groups. Focus group discussions were conducted within the institution settings. Sessions were carried out until a point of data saturation was reached to elicit rich data pertaining to the SSL program in its entirety. Sessions were conducted by the researcher using an interview guide developed and endorsed by an expert panel. The colour coding technique was used to identify themes from the transcribed interviews. A total of 15 female participants were interviewed. Their ages ranged between 12 to 22 years old. Three main themes emerged: Relevance, Practicality, and Acceptance. A respondent quoted "The lessons were taught in a fun way and helped me improve my self-confidence". The SSL program was easily understood and accepted by the participants. It was quoted that the educational materials and knowledge was delivered in a way that kept participants engaged and entertained. The SSL Program is a suitable intervention to promote social skills and mental wellbeing among institutionalized female youths.

PP2.061 "It's so boring!": assessing the impact of message fatigue on COVID-19 preventive behaviours among Malaysian adults

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Preventing COVID-19 is essential. However, frequent public health messages and preventative efforts may produce message fatigue, which reduces people's response and likelihood of prevention. This study analyses how message fatigue affected preventive behaviour in Malaysia during the COVID-19 pandemic. Online cross-sectional study of 2,943 Malaysians aged 18 or older was done in March–April 2021. Google Form was utilised for the survey. This study's survey instrument was adapted from previous research to ensure relevance and fit for Malaysia. The study findings suggest that Malaysian individuals are experiencing message fatigue. The respondents' average score for message fatigue was 69.3 (SD=22.4). Wearing masks (94.0%), avoiding crowds (75.6%), physical distancing (65.1%), and staying at home (60.9%) were the most common preventive behaviours. However, just 59.7% of responders routinely washed their hands. The study also showed the public's commitment to the "3Cs"—avoiding crowded places (64.9%), confined and close areas (66.0%), and close contact settings (56.7%). Additionally, a strong connection ($r=-0.155$, $p 0.001$) was seen between message fatigue and preventive behaviours. This shows a correlation between higher levels of message fatigue and reduced adherence to preventive behaviours. The study found that many responders still wear masks to prevent COVID-19. However, message fatigue may reduce COVID-19 prevention behaviour. Message fatigue may affect motivation and compliance with preventive interventions beyond mask use. Message fatigue's effects on preventive behaviours must be examined and solutions developed to minimise them.



PP2.062 KOSPEN Plus program at the workplace after 3 years of its implementation in Malaysia: from the implementers' perspective

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The study assessed the implementation of the KOSPEN Plus (KP), one of the programmes introduced by the Ministry of Health in Malaysia to address non-communicable diseases (NCDs) and promote healthy behaviours among workers in the workplace. The programme was conducted since 2016 and 786 workplaces were registered in 2018 implementing the KP programme. A cross-sectional study was conducted in 2020 among KP implementers at the selected facilities such as government health facilities, other government agencies and private agencies. It was a voluntary participation. KP implementers were given a set of questionnaires with 5-level Likert scale to measure their perception on the implementation of eight KP scopes at their workplace (healthy eating, smoking, active living, weight management, screening, mental health, work environment and alcohol use). A total of 362 KP implementers participated in the study describing the perception at their workplace. The findings revealed that over 80% of these entities implemented six out of the eight KP scopes. KP implementers perceived that health screening was the most widely implemented scope (95.6%), followed by mental health (92.0%) and active living (89.2%). A few other scopes were perceived as less implemented at workplace. Overall, the study indicated that the KOSPEN Plus program was well accepted by the organizations involved. The results suggest that a strong commitment from employers and the active cooperation of workers can contribute to improving the health of employees in the workplace.

PP2.063 Level of knowledge on palliative care among health care workers in community health centre at Hilir District, Perak: a pilot study

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Community-based Palliative Care Services in Malaysia have begun to be empowered through the implementation of the Dormiliary Care Services (DCS) program. In relation to that, a pilot survey type quantitative study was carried out on n=52 Assistant Medical Officers (AMOs) working in all Community Health Centers, Hilir Perak District to study their level of knowledge in relation to palliative care, the difference in knowledge level based on the location of work and its relationship to demographic data. The findings of the study obtained from the online questionnaire found that the level of knowledge of the respondents at the study location was at a high level with a mean score range of 1.00 to 1.89. However, the location of work proved not to affect the level of knowledge of the respondents related to palliative care because the p value from the ANOVA test recorded 0.202. Six (6) demographic factors that were studied were also known to not have any significant correlation when all the results of the Chi-Square coefficient test published values greater than the significance value of 0.05 ($p > 0.05$). Based on the findings, some strategies have been recommended by the writer to the District Health Office Hilir Perak (DHOHP) and researchers in the future. One of them is, DHOHP encourages the continuation of existing training activities by implementing internal courses as well as CME (Continuous Medical Education) complement with practical training at least twice a year. DHOHP is also advised to provide support and create an internal audit team to ensure DCS implementations along with set objectives and improvements can be done in future.

PP2.064 Machine learning-algorithm model for predicting the premix drinks intake among Malaysian adults: National Health Morbidity Survey 2019

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Understanding why people choose premixed drinks is important for tackling public health concerns, encouraging healthier lifestyles, and reducing sugar-sweetened beverages (SSB) consumption. The study aims to compare machine learning models to identify the significant factors influencing premixed drinks consumption among Malaysian adults. These factors encompass socio-demographics, physical activity levels, dietary practices, and nutritional status. By leveraging machine learning, various techniques to assess and compare model performance, are more effective than traditional approaches that may overlook the complexity of the data. Data from National Health Morbidity Survey (NHMS) 2019, a nationwide cross-sectional survey were analyzed for adults aged 18 years and above. Four common machine learning models; Logistic Regression (LR), Naïve Bayes (NB), Gradient Boosted Trees (GB), and Random Forest (RF) were used to predict premixed drink intake a week. The best model performance was evaluated based on the score of accuracy, precision, f-measure, sensitivity, specificity, and area under the receiver operating characteristics (ROC-AUC). A total of 10,464 samples from NHMS 2019 were selected, with a prevalence of 22.2 percent of adults who drank at least one type of premixed SSB a week. The RF model performed the best model, achieving the highest performance with an accuracy (76.95%), precision (74.13%), f-measure (78.23%), sensitivity (82.81%), and specificity (71.10%) and ROC-AUC (0.849). These findings demonstrate that a machine learning algorithm can effectively predict the most significant factors influencing premixed drink consumption. These algorithms can guide initiatives and regulations to promote healthier lifestyles and reduce SSB intake among the Malaysian adult population.

PP2.065 Maternal height is associated with the risk of gestational diabetes mellitus

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Nutritional deprivation during childhood is believed to contribute to short stature that impairs β -cells' development and function in future. Studies have reported an inverse association between type 2 diabetes mellitus (T2DM) and height, predominantly observed in women. As T2DM and gestational diabetes mellitus (GDM) share similar pathogenic factors, shorter height could have the same effect on GDM risk. Therefore, the aim of this study was to evaluate the associations between maternal height and GDM risk. A total of 1,315 antenatal records of mothers with singleton pregnancies from eight health clinics of a district in Kedah who delivered from 1st January 2016 to 31st December 2017 were included in this study. Anthropometric data were extracted from the records and analysed retrospectively. The t-test and chi-square (χ^2) tests were used to check for correlations between variables. All covariates were tested in the multivariate analysis to examine the associations with GDM. Maternal height was significantly associated with the risk of GDM, while no significant associations were found in weight at booking (gestational age <14 weeks), BMI status and gestational weight gain (GWG). Women with maternal height of <1.50 m had 2-fold increased risk of GDM (AOR: 1.75 [95% CI: 1.06–2.90; p<0.05]) compared to women with maternal height of >1.60 m. The association between short height and GDM may be influenced by factors such as genes, nutrition, hormones, and socioeconomic status that could mediate the effects. Future studies to evaluate the effect of height on GDM risk considering other covariates are warranted.



PP2.066 Methodology of National Health and Morbidity Survey (NHMS): Adolescent Health, Malaysia 2022

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In Malaysia, the National Health and Morbidity Survey: Adolescent Health Survey (NHMS: AHS) conducted in 2012 and 2017 revealed an increasing trend of adolescent health risk behaviours and protective factors. This current survey aims to determine health risk behaviours and protective factors among adolescents in the country. The current nationwide cross-sectional survey of Malaysian secondary school students used multistage stratified sampling to select 240 nationally representative schools. This survey was conducted from June to July 2022 among the students in forms 1 till 5 in all states by 34 data collection teams. A validated self-administered questionnaire from Global School-based Health Survey (GSHS) was used. Data management and quality check were supervised by the Central Coordinating Team (CCT). Sample weighting and analysis were conducted using SPSS statistical software. A total of 239 schools and 33,523 students were involved in this survey with the overall response rate of 89.0%. Based on the state, the highest number of students who participated in the survey were from Terengganu (95.9%), followed by Kedah (93.9%) and Perlis (92.8 %). In terms of ethnicity, the highest number of students who participated in the survey were Malay (63.0%), followed by Chinese (18.1%) and Indian (6.0 %). While the distribution of sex and form among the students were almost the same. The NHMS: AHS served as the platform to produce national representative data for adolescents. All necessary steps, including survey design, questionnaire validation, data collection method, quality control, and data management has been performed to assure the accuracy and high-quality data.

PP2.068 Milk and milk products consumption: findings from The National Health and Morbidity Survey 2022 (Adolescent Health Survey)

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Despite growing evidence that consuming dairy products offers numerous health advantages, there has been an alarming decline in these food groups consumption globally in recent decades. This study aimed to determine the prevalence milk and milk products intake among Malaysian adolescents. A cross-sectional survey among secondary school students was conducted in the year 2022. The sampling frame included both public and private schools under the Ministry of Education (MOE) and Rural and Regional Development (MARA). Final sample sizes for adolescents at national and state levels were 36,000 and 2250, respectively, with 240 schools being randomly selected. Overall, 23.2% of adolescents (95% CI: 22.39, 23.98) reported to consumed milk or milk products at least twice daily in the past 30 days. Johor had the lowest prevalence of adolescents' milk/milk product intake (20.7%, 95% CI: 18.52, 23.10) and WP Putrajaya had the highest prevalence (28.3%, 95% CI: 26.96, 29.77). Results showed that girls (23.5%, 95% CI: 22.46, 24.58) consumed milk and milk products at an amount that is slightly higher than boys (22.9%, 95% CI: 21.83, 23.90), however, the difference was not significant. There was also no significant difference in milk and milk products consumption across ethnicities. The recent findings suggest low consumption of milk among Malaysian adolescents. Consuming milk and milk products may promote bone health and lower the incidence of fractures in old age. This can be accomplished by strengthening school-based nutrition programmes, utilising social marketing techniques, and engaging the support of communities.

PP2.069 National prevalence and sociodemographic determinants of social delay among children below 5 years old in Malaysia

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In the past, an estimated of 1.2% of Malaysian children experienced delays in reaching the expected social development milestones compared to their same-age peers, referred to as social delay. This study aims to describe the recent prevalence as well as sociodemographic determinants of children with social delay in Malaysia. Data from National Health and Morbidity Survey 2022: Maternal & Child Health were utilised for this study. Children aged 6-59 months old were assessed by trained nurses using Denver Development Screening Chart, and subsequently classified into social delay if they did not meet the expected social development milestones. Complex sample descriptive analysis and multiple logistic regression analysis were carried out using SPSS version 23 to get the prevalence and sociodemographic determinants associated with social delay. The prevalence of social delay in 2022 was 4.1%. Sociodemographic determinants with higher rates of social delay includes boys (4.8%), children aged 24-35 months (6.4%), Chinese ethnicity (5.2%), non-Malaysian citizen (4.6%), rural residents (4.2%) as well as those in T20 household income groups (5.1%). Multiple logistic regression analysis showed boys (aOR=1.53; 95% CI: 1.18, 2.01) and children aged 24-35 months (aOR=3.49; 95% CI: 1.82, 6.67) were the independent determinants associated with social delay. The prevalence of social delay has greatly increased, underscoring the urgent need to identify innovative strategies supporting healthy social development in children. Preventive actions should be targeted in children before the age of 24 months. Further research exploring the causes of social delay among children aged 24-35 months is highly recommended.

PP2.070 Naturally occurring anti-HLA antibody in an unsensitized male donor: a case report

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Human Leukocyte Antigen (HLA) antibodies have been implicated as a cause Transfusion Related Acute Lung Injury (TRALI). It is commonly formed by alloimmunization from pregnancy, blood transfusion, or transplantation but may rarely be found in nulliparous females and non-alloimmunized males. A 46-year-old Malay gentleman underwent below-knee amputation for Left foot Necrotising Fasciitis. The patient had severe anaemia post-operatively and required one-unit packed cell transfusion. Approximately 1 hour into the transfusion, the patient developed acute respiratory distress. Clinical presentation and imaging results suggested TRALI and HLA typing/antibody test was sent. Screening for HLA antibodies showed the donor had multiple specific anti-HLA antibodies. Donor history showed the donor was a 26-year-old male who had previously been healthy. There was no history of blood transfusion or transplantation. Given no sensitizing event, the donor re-tested in six months, revealing the same antibody specificity. Considering persistent multi-specific antibodies for HLA Class II detected the donor was permanently deferred for blood donation. Naturally occurring HLA antibodies were always described as a rare occurrence. Only several publications revealed that healthy male donors who have never been alloimmunized have HLA antibodies (1-3). This case report showed an incidental finding of natural anti-HLA antibodies in a healthy male donor without a prior sensitizing event. Given the severe impact of anti-HLA antibodies, we would advocate that donors who have demonstrable antibodies and who have been implicated in TRALI reactions should be excluded from future donations.



PP2.072 Overweight and obesity among Malaysian adults: prevalence, trend, and its associated factors

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According to the World Health Organization's predictions, many countries, including those with middle- and low-income levels, will be impacted by the worldwide rise in overweight and obesity. Therefore, this study aims to determine the prevalence trend and factors associated with overweight and obesity among Malaysian adults. The prevalence trend of overweight and obesity was analysed based on adult respondents from national survey data, the National Health and Morbidity Survey (NHMS) Malaysia, from the years 2011, 2015, and 2019, respectively. Logistic regression was conducted among 9,782 Malaysian adults from NHMS 2019 to identify the associated factors (socio-demographic data, lifestyle behaviours, and non-communicable diseases) with overweight and obesity. The results from this study indicated that the prevalence of overweight and obesity among Malaysian adults was on an increasing trend, from 44.5% in 2011, 47.7% in 2015, to 50.1% in 2019. Multivariate analysis revealed that females, those aged 30 to 59 years, Malays, Indians, or other Bumiputeras, as well as those who were married and had adequate health literacy, were significantly associated with a greater risk for overweight and obesity. Furthermore, those diagnosed with non-communicable diseases (diabetes and hypertension) were also significantly associated with a greater risk of overweight and obesity. Overweight and obesity contribute to chronic diseases, strains healthcare systems, and negatively impacts overall health and well-being of the population. In conclusion, public health nutrition intervention strategies should engage these high-risk populations in an equitable and cost-effective manner to alleviate the increasing pressure of overweight and obesity in Malaysia.

PP2.073 Physical activity and its association with dietary intake among adolescents in Malaysia: findings from the National Health Morbidity Survey (NHMS) 2022

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Optimum dietary intake and physical activity are essential for adolescent's healthy growth and development. This study was conducted to determine the association between physical activity and dietary intake among adolescents in Malaysia. This study utilised data from the nationwide cross-sectional Adolescent Health Survey 2022, with participation from 33,523 school-going adolescents. This self-administered survey utilised the Global School-based Student Health Survey (GSHS) core questionnaire modules & core-expanded questions which include measures of physical activity and dietary intake. Multiple logistic regression for complex sampling analyses was performed using SPSS version 26.0. The prevalence of physical activity was found to be 21.4% (95% CI: 20.45, 22.37), while the rates of fruit intake and carbonated soft drink consumption were 37.3% (95% CI: 36.20, 38.41) and 32.4% (95% CI: 30.93, 33.87) respectively. Multivariate analysis showed that healthy dietary intake such as consuming milk (aOR=1.33; 95% CI: 1.23, 1.45), fruits (aOR=1.18; 95% CI: 1.10, 1.27), vegetables (aOR=1.34; 95% CI: 1.25, 1.44) and plain water (aOR=1.69; 95% CI: 1.55, 1.85) were positively associated with physical activity. On the other hand, the analysis also revealed that individuals who consumed carbonated soft drinks (aOR=1.22; 95% CI: 1.11, 1.33) and had a fast-food diet (aOR=1.19; 95% CI: 1.07, 1.33) were positively associated with physical activity. This study demonstrated that dietary habits both healthy and unhealthy, had a significant impact on physical activity among adolescents. Therefore, it is necessary to create impactful health programs and interventions in schools to promote physical activity and encourage healthy dietary habits among adolescents in Malaysia.

PP2.074 Physical inactivity and mental health problems among adolescents in Malaysia

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The detrimental interrelationship between physical inactivity and mental health issues poses a significant concern, specifically for adolescents. This study explored the association between physical activity and mental health problems among school-going adolescents. The study utilised data from the nationwide cross-sectional Adolescent Health Survey 2022, with 33,523 school-going adolescents participating in this survey. This self-administered survey used the Global School-based Student Health Survey (GSHS) core questionnaire modules & core-expanded questions that included measures of physical activity and mental health. Physical inactivity was defined as not being physically active for at least 60 minutes daily for five days or more in the past seven days. Descriptive and complex sample logistic regression analysis were performed using SPSS version 26.0. The prevalence of physical inactivity was 78.6% (95% CI:77.64,79.56). Multiple logistic regression revealed that female (aOR:2.29, 95% CI:2.10,2.50), Chinese (aOR:1.26, 95%CI:1.07,1.48), Indian (aOR:0.58, 95% CI:0.49,0.69), and Bumiputera Sarawak (aOR:1.47, 95% CI:1.22,1.77) ethnicities, those who could not sleep due to worry (aOR:0.76, 95% CI:0.68,0.86), had suicidal ideation (aOR:1.15, 95% CI:1.01,1.31), and had depression (aOR:1.11, 95% CI:1.02,1.22) were significantly associated with physical inactivity. Our findings found that adolescents with suicidal ideation and depression are more likely to be physically inactive. At the same time, those who could not sleep due to worry had lesser odds of physical inactivity. Addressing mental health problems as a barrier to physical activity in adolescents is essential. It requires a comprehensive approach that includes strengthening coping skills and resilience and ensuring that mental health support services are readily available to address mental health problems and promote overall well-being.

PP2.075 Predicting & identifying the factors affiliated to overweight or obesity in Malaysia using machine learning algorithms

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Overweight or obesity pose significant challenges to public health globally and Malaysia is no exception. In recent years, the country has experienced a concerning rise in obesity rates, making it a critical public health issue. According to recent reports, Malaysia recorded the highest obesity rates in Southeast Asia with approximately 30% of adults classified as overweight. In light of these pressing concerns, a research study was undertaken to predict and identify factors associated with overweight or obesity in Malaysia using machine learning algorithms. Machine learning was chosen as it offers the ability to handle complex and high-dimensional data sets compared to traditional statistical methods. Data from the National Health and Morbidity Survey (NHMS) 2019 was analysed with sample size of 9,811 participants. The study used logistic regression, random forest, and decision tree to identify the most effective algorithm. Random forest demonstrating the highest accuracy with 84.98%, precision (88.64%), F-measure (89.49%) and sensitivity (90.35%). This study identified waist circumference, income, age, locality, state, education level, ethnicity and gender were among significant factors influencing overweight or obesity in Malaysia. The findings of this research have important implications for public health organizations, healthcare professionals, policy makers and researchers in their efforts to combat the obesity epidemic in Malaysia and improve population health outcomes.



PP2.076 Predicting diabetes mellitus and factor associated using machine learning models: findings from National Health & Morbidity Survey (NHMS) 2015

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Diabetes Mellitus is one of the major global health problems and poses a serious global burden on public health. Diabetes Mellitus prevalence has increased in recent decades in most developed and developing countries. Machine learning (ML) models have been shown to outperform clinical risk prediction compared to statistical methods, but studies using ML to predict Diabetes Mellitus in Malaysia are lacking. We conducted a retrospective study using ML analyses to predicted Diabetes Mellitus using secondary data on population-based surveys, National Health & Morbidity Survey (NHMS) 2015. Adults age more than 18 years old was selected. The dependents or target variables was Diabetes Mellitus status and 33 independents or predictor variables with 21 in categorical type and 12 in numerical type. We applied 3 common ML-based classifier's which are logistic regression (LR), Naive Bayes (NB) and Random Forest (RF) to predict the Diabetes Mellitus and the associated factors influence Diabetes Mellitus. ML models was compared using accuracy, precision, recall, f-measure, and area under ROC curve (AUROC) to find best ML models. From the 19,935 respondents, 4,229 (21.20%) had Diabetes Mellitus. ML models showed that top ten (10) most significant factors for Diabetes Mellitus were glucose reading, systolic blood pressure, age, diastolic blood pressure, total household income, weight, total individual income, height, BMI, and average intake of fruits and vegetables. RF is found to be the best ML model to predict Diabetes Mellitus since RF has the highest score on all evaluation performance such as accuracy (87.53%), Precision (88.22%), Recall (86.63%), f1-score (87.42%) and AUC (0.95) as compared to others ML. The ML model performed well in predicting Diabetes Mellitus and related factors in Malaysian adults. RF is the best model for predicting Diabetes Mellitus using important factors such as glucose reading, systolic blood pressure, age, diastolic blood pressure, total household income, weight, total individual income, height, BMI, and average intake of fruits and vegetables. Future study should be done to improve the ML algorithms and build more classifier ML models to evaluate them in practice.

PP2.077 Predictive modelling of association between dementia and hearing loss among Malaysian elderly using machine learning model: findings from NHMS 2018

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Dementia and hearing loss are prevalent conditions among the elderly, impacting their well-being and public health. Despite the superior predictive accuracy of machine learning (ML) over traditional statistical methods, there is limited research on utilizing ML to predict the association between dementia and hearing loss. This study aims to fill this gap by employing ML models for prediction. Data from the National Health and Morbidity Survey (NHMS) 2018, a nationwide cross-sectional survey, were analysed. The study included Malaysian individuals aged 50 and above. Dementia status was the primary outcome, with hearing loss as the main factor. Sociodemographic, lifestyle, and comorbidity factors were adjusted for. Four common ML classifiers; logistic regression (LR), Naive Bayes (NB), Gradient Booster (GB), and Random Forest (RF) were used to predict the association. ML models was then compared through their accuracy, precision, recall, F1-score and area under the receiver operating characteristics (ROC-AUC) scores as the best ML model. Among 3,777 elderly individuals, the prevalence of dementia was 8.4%, hearing loss was 3.7%, and 18.7% of those with dementia had hearing loss. RF emerged as the superior ML model, demonstrating the highest scores in accuracy (80.79%), precision (81.68%), recall (79.38%), F1-score (80.51) and ROC-AUC (0.892) compared to other ML models. This study highlights a significant association between dementia and hearing loss in Malaysian elderly individuals. The findings emphasize the importance of considering various confounding factors in examining this association. The developed RF predictive model shows promise for accurate prediction in this context.

PP2.079 Prevalence and associated factors of perceived poor adolescent-parental relationship with high-risk behaviours among Malaysian adolescents: findings from Adolescent Health Survey (AHS) 2022

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The adolescent-parental relationship is one of the factors in determining adolescents' high-risk behaviours which is adequately not explored in Malaysia. This study aims to determine the prevalence and associated factors of perceived poor adolescent-parental relationships with high-risk behaviour among Malaysian adolescents. Data from the Adolescent Health Survey was used which was conducted as a cross-sectional study from June to July 2022 among national representative sample of secondary school students. A two-stage stratified cluster random sampling technique was used to select the respondents. Poor relationships are defined as those answering the Likert scale of score ≤ 3 . Descriptive analysis and multivariable logistic regressions were used to analyse the relationship between parental bonding and connectedness, and high-risk behaviours. A total of 33,523 respondents participated. The overall prevalence of perceived poor relationship was 58.0% (95% CI=56.9, 59.2), significantly higher among females (61.0% vs 55.1%; p-value <0.001). The perceived poor relationship among adolescents was associated with females (aOR: 1.40, 95% CI=1.30, 1.52) and whose parents were living apart (aOR: 1.26, 95% CI=1.17, 1.35). For high-risk behaviours, perceived poor relationships among adolescents were associated with ever having sexual intercourse (aOR: 1.49, 95% CI=1.30, 1.70) and current e-cigarette smokers (aOR: 1.50 95% CI=1.33, 1.68). More than half of the adolescents perceived poor relationships with their parents that lead to high-risk behaviours. Thus, parents should be aware and take prompt action to have a better relationship with adolescents. This can be done by active listening, offering emotional support, and creating a safe and open communication environment.

PP2.080 Prevalence and determinants of self-medication practice: finding from NHMS 2019

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Self-medication is the practice of using medications without a prescription or medical supervision, and it is becoming more popular worldwide. If self-medication is not done appropriately, it can lead to serious health risks like drug interactions and addiction on certain medications. Therefore, this study was to determine the prevalence of self-medication and identify associated factors with explore the reasons for self-medication practice. Data were obtained from the National Health and Morbidity Survey (NHMS) 2019, a nationwide cross-sectional survey that implemented a two-stage stratified random sampling design. Data were examined from 3,045 Malaysians who had acute health problem within the previous two weeks of the interview. Complex sample analysis, including descriptive statistics and logistic regression, was used to analyse the data using SPSS version 28. About 641 (20.9%) practicing self-medication, with majority were Malay (66.5%) and adults aged 18 to 59 (58.8%). Chinese was found significantly higher compared to Bumiputera of Sarawak (AOR = 2.18, 95%CI: 1.16-4.10). Additionally, the analysis revealed a significant association with marital status, particularly among those with a single status, demonstrating a higher AOR of 1.53 (95% CI: 1.04-2.26). The main reasons for self-medication are perceived not being sick enough and self-medicated. In conclusion, ethnicity and marital status are associated with an increased probability of practicing self-medication. The findings suggest the need for targeted interventions and educational programs to promote responsible self-medication practices and enhance overall healthcare outcomes. This study also can give a guidance for stakeholder or policy maker to develop better programme and campaign in the future.



PP2.081 Prevalence and factors affecting poor oral hygiene practice in adolescents – findings from National Health and Morbidity Survey (NHMS): Adolescent Health Survey (AHS) 2022

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Good oral hygiene practice, including brushing twice a day with fluoridated toothpaste, flossing, tongue cleaning and yearly dental check-up, are important during adolescence as they have a significant impact on oral health in adulthood. This study aimed to estimate the prevalence and identify factors associated with poor oral hygiene practice among adolescents. It employed a nationwide cross-sectional survey with a two-stage randomised stratified cluster sampling, involving 240 schools and a total sample size of 36,000 adolescents. The dental hygiene questionnaire used was adapted from the Global School-Based Student Health Survey. Complex sample analysis was performed using SPSS version 26.0 with 95% confidence interval. Out of 33,523 adolescents who answered the survey, 17.8% did not brush at least twice daily, 53.3% did not use fluoridated toothpaste, 55.8% did not practice daily tongue cleaning, 67.4% did not see a dentist in the previous 12 months and 78.6% did not practice flossing. Furthermore, 5.51% of the adolescents exhibited poor practice in all five aspects above, which was significantly higher among males (66.3%; CI: 61.8%, 68.5%), Form 1 students (28.3%; CI: 25.2%, 31.6%) and Malay ethnicity (56.7%; CI: 50.2%, 63.0%). In light of the 2021 Resolution on Oral Health, preventive strategies targeting male students, especially those in lower forms, should be implemented to promote good oral health among adolescents.

PP2.084 Prevalence of ever-use of drugs and the associated factors among adolescents in Malaysia

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Drug abuse is detrimental, and excessive drug usage is a worldwide problem. Drug usage typically begins during adolescence. The study aimed to determine the prevalence of ever-use of drugs and the associated factors among adolescents in Malaysia. A sub-analysis study of the National Health and Morbidity Survey 2022: Adolescent Health Survey was conducted among secondary school students in Malaysia. Self-administered interview using a structured and validated questionnaire was used to obtain data from adolescents aged 13-17 years. Multivariate binary logistic regression was used to determine factors associated with the ever-use of drugs. Among 33,523 adolescents, more of them were 13 years old (21.3%), females (53.8%), Malays (69.0%), living together with married parents (80.0%), and in Form One (21.5%). Around 27.2% had depression, 12.1% ever smoked tobacco, and 15.8% ever drank alcohol. The prevalence of ever-use of drugs was 5.2% (95% CI: 4.7-5.7%). Multiple logistic regression analysis revealed that sex, ethnic groups, and parental marital status were associated with the outcome. Those who had depression, ever smoked tobacco, and ever drank alcohol were more likely to have ever-use of drugs. The prevalence of ever-use of drugs among adolescents in Malaysia is alarming. Relevant holistic approaches should be strengthened not only by relevant government agencies but also by the private sector and non-governmental organizations by promoting protective factors while reducing risk factors in programs involving adolescents from primary school up to adulthood to prevent and control drug abuse.

PP2.085 Prevalence of HIV stigma and factor associated with discriminatory attitudes toward people living with HIV/AIDS (PLWHA) among people aged 15-49 years in Malaysia: a nationwide survey

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Stigma and discrimination toward PLWHA can lead to negative impacts on psychosocial and their overall well-being. This study utilised secondary data from the National Health and Morbidity survey 2020, a national cross-sectional population-based study. Data on HIV stigma was collected via self-administered approach due to sensitive items. A total of 2,818 people aged 15-49 years were extracted who responded to HIV stigma module which consisted of six domains. The prevalence of UNAIDS global indicator for discriminatory attitudes towards PLWHA was 78.7%. This study also measured other domains such as fear of HIV infection, social judgement, anticipated stigma, and perceived stigma which were at 64.4%, 44.9%, 57.6% and 42.2%, respectively. In the multivariable logistic regression, factor associated with discriminatory attitudes toward people living with HIV/AIDS (PLWHA) were lower education and those who resided in rural areas. Stigma and discrimination toward PLWHA are prevalent among people aged 15-49 years in Malaysia. A prompt action needs to be taken to reduce the stigma and discrimination attitudes in achieving the goal of ending the AIDS epidemic by 2030.

PP2.086 Prevalence of impaired fasting glucose and associated risk factors among Malaysian adult population: a comparison between WHO and ADA criteria

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Impaired fasting glucose (IFG) is a condition when a person's blood glucose level is above the normal range, but below the diagnostic cut-off for a formal diagnosis of diabetes mellitus. The objective of this study was to compare the prevalence of IFG among adults aged 18 years old and above and its associated risk factors between the American Diabetes Association (ADA) and World Health Organization (WHO) criteria. Data were obtained from the National Health and Morbidity Survey (NHMS) 2019, a cross-sectional study which was conducted among a targeted population in Malaysia using two-stage stratified random sampling method. Adults aged 18 years old and above with fasting capillary blood glucose (FBG) readings of ≤ 6.9 mmol/L were selected, except those known to have diabetes. IFG was defined according to ADA (FBG 5.6-6.9 mmol/L) and WHO criteria (FBG 6.1-6.9 mmol/L). Descriptive and complex sample logistic regression analyses were performed using SPSS version 28.0. A total of 6,183 respondents were involved, with the overall prevalence of IFG was 42.8% using ADA criteria whereas 22.6% using WHO criteria. Multiple logistic regression analysis found that age groups of 40 to 59 years old and Malay ethnicity were found to be independently associated with IFG using ADA criteria. Both criteria showed that age groups of 60 and older and married people were strongly related to IFG. It was recommended that early screening for diabetes should be performed annually in those with risk factors especially adults aged 40 and above.



PP2.087 Prevalence of parental refusal for children's vaccinations and its associated factors in Asia: a systematic review and meta-analysis

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Vaccine refusal is defined as unwillingness to allow oneself and/or family members to be vaccinated or immunized against preventable disease for example COVID-19, measles, and others. This issue is complex and context-specific, varying according to time, geography, and vaccination type. We review the published studies regarding the evidence on the prevalence of parental vaccine refusal in Asia and identify the factors associated with it. We searched electronic databases from inception to February 2023. We included population-based studies that reported the prevalence of parental vaccine refusal and the factor associated to it. We used meta-analyses to determine the pool prevalence to estimates of parental refusal. A total of 186 studies met our inclusion criteria, comprising data on 407,195 parents from Asia. Overall prevalence of vaccine refusal was 28.0% (95% CI: 20.0–32.0%), with a high-level of heterogeneity between studies ($I^2=99.96\%$, $p=0.001$). The concerns about vaccine safety and efficacy, lack of awareness and lack of understanding of vaccine-preventable diseases and religious had been identified as the reasons of parental vaccine refusal. Vaccine refusal remains challenge in children, and it can be observed with the high prevalence of vaccine refusal among parents in Asia region. The study concludes safety concerns along with factors related to availability, accessibility, affordability, and acceptability of vaccinations as the main reason for vaccine refusal among parents in Asia.

PP2.088 Prevalence of physical abuse at home and its associated factors among adolescents in Malaysia: findings from the National Health and Morbidity Survey in 2022

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Physical abuse is defined as an act that causes harm or is intended to cause harm to a child. This study aimed to determine the prevalence of physical abuse at home among adolescents in Malaysia. The data was obtained from the National Health and Morbidity 2022, a cross-sectional study conducted from June to July 2022. An adapted Global School-based Student Health Survey (GSHS) questionnaire was used to collect data from school-going adolescents aged 13-17 years old. Prevalence and binary logistic regression analysis were carried out, taking into account the multistage cluster design, using IBM SPSS ver. 28.0. A total of 33,523 respondents participated in the survey with a response rate of 89.4%. The prevalence of physical abuse at home among adolescents was 7.5% (95% CI = 7.00-8.00). Multiple logistic regression analysis showed that younger age had higher odds of experiencing physical abused at home. Female adolescents (aOR= 1.34, 95% CI= 1.15-1.54) had higher odds of physical abuse at home compared to males. Physical abuse at home was also found to be associated with high-risk behaviours such as depression, suicidal attempts, smoking cigarettes, alcohol use, drug use, truancy, physical fights and being bullied. The study revealed that the physical abuse at home was associated with mental health problems, substance abuse and problems at school. Thus, a comprehensive approach involving schools, professionals, and the community is warranted to address this issue and protect adolescents from physical abuse at home.

PP2.089 Prevalence of sedentary behaviour among adolescents in Malaysia: findings from A National School-Based Health Survey 2022

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In recent years, there has been a significant increase in sedentary behaviour among teenagers, which means they are not physically active and spend excessive time sitting. This is worrisome because it can lead to various health issues like obesity, heart problems, and mental health disorders. The study aimed to determine the prevalence of sedentary behaviour among adolescents in Malaysia. A sub-analysis study of the National Health and Morbidity Survey 2022: Adolescent Health Survey (AHS) was conducted among secondary school students in Malaysia from June to July 2022. Data were obtained via a self-administered, structured, and validated questionnaire from the Global School-based Student Health Survey (GSHS). Sedentary behaviour was defined as sitting for 3 hours or more in a typical or usual day for leisure activity. Descriptive analysis was conducted using IBM SPSS Statistics version 25.0. Among the 33,523 adolescents involved in this study, 66.7% were found to have engaged in sedentary behaviour. There were significant differences in terms of sex, ethnicity, and form, with the highest prevalence observed among females (67.5%), Chinese (78.4%) and Form 4 (73.9%) students. Two out of three adolescents were found to practice sedentary behaviour, with an increased prevalence in the current study compared to previous studies conducted in 2012 and 2017. This problem seems to be more prevalent among females, Form 4 and Chinese students. Implementing effective strategies that reduce sedentary behaviour and promote regular physical activity are vital to support the health and well-being of adolescents.

PP2.090 Prevalence of truancy among school-going adolescents in Malaysia: findings from the National Health & Morbidity Survey (NHMS) 2022

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Truancy is a serious educational issue associated with high-risk behaviours among the adolescents. It is essential to have national estimates in order to establish regular monitoring mechanisms. The study aimed to investigate the prevalence of truancy by sociodemographic characteristics and high-risk behaviours among school-going adolescents in Malaysia in 2022. This is a cross-sectional nationwide study using multistage stratified cluster sampling design among school-going adolescents using Global School-based Student Health Survey and Adolescent Health Survey, a validated self-administered questionnaire from the World Health Organization. Out of 37,479 eligible adolescents, a total of 33,020 students aged 13 to 17 years old participated in this study. Data was analysed using complex sample analysis and the Rao-Scott chi-square test with p -value <0.05 was considered statistically significant. The overall prevalence of truancy among school-going adolescents in Malaysia in 2022 was 25.6% (95% CI: 24.3, 27.0). The prevalence of truancy was significantly higher among males, older age, adolescents with separated/ divorced/ widowed parents and Bumiputera Sabah ethnicity ($p < 0.001$). The prevalence of truancy was also significantly higher among adolescents who experienced physical attacks, being bullied, ever drug user and current any tobacco products user ($p < 0.001$). In conclusion, this survey findings revealed a significantly higher prevalence of truancy among Malaysian school-going adolescents in certain demographic factors and high-risk behaviours. These findings emphasize the importance of developing interventions and strategies towards the targeted group such as extra monitoring for bullying activities or awareness program for older adolescents to reduce truancy and eventually improve their well-being.



PP2.091 Risk classification of cervical cancer screening utilisation among Malaysian adults' women: a machine-learning approach

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With the development of data mining, the Machine Learning (ML) algorithm offers opportunities in classification-based scenarios in the medical field. Furthermore, the ML algorithm is shown able to overcome the nonlinear interaction factors to outcomes that might be oversimplified in a conventional statistical model. To date, there is limited data on the risk classification of cervical cancer screening utilization among Malaysian adult women. Hence, we aimed to investigate the features that contributed to cervical screening utilisation among Malaysian adult women, using the advent ML algorithm. We utilised the data from a total of 5,682 Malaysian adult women who participated in the National Health and Morbidity Survey 2019. The dataset that consists of the sociodemographic factors and status of cervical screening utilization was split into the training and test sets, with a ratio of 80:20, i.e., 80% training set and 20% test set, and the model building was performed using the XGBoost technique in ML. Our data demonstrated age gives the highest gain to the model (58%), followed by race (14%) and marital status (11%). Further observation showed that the accuracy, F1 score, and area under the curve value of the built model to predict the screening utilization was 67%, 71.3%, and 66.2%, respectively. Findings from this study demonstrated that age, race, and marital status are predictors of cervical cancer utilization among Malaysian adult women. Furthermore, the XGBoost technique could aid the effort of risk classification among Malaysian adult women for cervical cancer screening.

PP2.092 Risk communication during COVID-19 pandemic among remote communities in Peninsular Malaysia

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Risk communication is a complex, multi-sectorial approach that would be key in managing risk including during the global health emergencies of the coronavirus disease 2019 (COVID-19) pandemic. This would contribute to hazardous effects for the individuals and communities on their survival, health, socio-economic, and wellbeing. This study aimed to investigate risk communication methods, comprehension, and information adequacy among remote communities in Malaysia during the COVID-19 pandemic. This cross-sectional survey was conducted in remote areas of Peninsular Malaysia from September to November 2021. Two-stage stratified random sampling was utilised based on the Population and Housing Census of Malaysia 2010 with 39 locations selected. A total of 504 heads of households (HH) were interviewed face-to-face. Data was analysed using the SPSS software. Major source of information on COVID-19 among remote communities was from television/radio (36.7%), followed by media social (33.3%), friends/family members (16.2%), government agencies (7.9%), and newspaper/printed materials (5.9%). More than half of the respondents understood (61.3%) the given information, followed by sound understanding (19.0%), and partial understanding (15.7%). Most respondents perceived the obtained information as adequate (82.1%). This study showed consistency with another study in this region that highlighted the significant methods of the government disseminated social media during the pandemic emergency. However, this could be differed from another country that reported rural communities' close links with both local governance and NGOs. The findings offer an opportunity for stakeholders in identifying the main platforms for effective risk communication during health emergencies and strategizing response plans.

PP2.093 Risk factors associated with diabetes complications among type 2 diabetes in Selangor: result from National Diabetic Registry

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Risk factors, such as age, duration of having type 2 diabetes mellitus (T2DM) and waist circumference (WC) might play a role in the development of diabetes complications. Aim of this study to determine the association of risk factors to develop diabetes complications among T2DM. A retrospective study utilising a data from National Diabetic Registry (NDR) was conducted. Adult patients diagnosed with T2DM, aged 18 years old and above in Selangor and had no manifestation of diabetes complications prior to T2DM diagnosis were included. Age groups, gender, duration of having T2DM and WC were analysed in this study. A multivariate logistic regression analysis was conducted to determine the risk factors. A total of 63,062 patients with T2DM was identified, of which 39.3% were males. The mean age of the patients was 60.0 years old (SD 11.2). The mean duration of having T2DM was 7.2 years (SD 5.4). About 28% of T2DM patients had diabetes complications. Those aged 45 years old and above were at higher risk to develop complications compared to those below 45 years old ($p < 0.001$). A year increase in the duration of having T2DM would increase 1.07 times risk to develop diabetes complication (aOR 1.07, 95% CI 1.06 – 1.08, $p < 0.001$). Besides that, a centimetre increase of WC would increase the risk to develop diabetes complications (aOR 1.01, 95% CI 1.00–1.01, $p < 0.001$). Age groups, duration of having T2DM and WC were found to be significant factors associated with increased risk to develop diabetes complications.

PP2.094 Seroprevalence of measles and rubella IgG antibodies among National Public Health Laboratory (NPHL) personnel: implications for biosafety

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Seroprevalence studies play a crucial role in assessing the evidence of immunity based on the detection of Measles and Rubella IgG antibodies. Seroprevalence surveillance among laboratory personnel can be used as to monitor laboratory-acquired infections resulting from accidental exposure during performing their work processes. This study aimed to evaluate the seroprevalence of Measles and Rubella IgG antibodies among laboratory personnel handling specimens suspected of measles and rubella infections in NPHL. Blood specimens were collected on-site from 42 laboratory personnel by a qualified Epidemiology Officer trained in phlebotomy techniques. After collection, the specimens were centrifuged to obtain the serum for further testing. Measles and Rubella IgG antibodies were detected using a semi-automated indirect Enzyme Linked Immunosorbent Assay (ELISA). The results were interpreted by calculating the ratio of specimen optical density (OD) to the calibrator reading, generating the immune status ratio (ISR). Among the participants, one individual showed no seroconversion for both measles and rubella, while eleven individuals showed no seroconversion for either measles or rubella IgG. The analysis of the results revealed a high seroprevalence, with 29 out of 42 (69%) serum specimens indicating protection against measles and rubella infection among laboratory personnel. These findings hold significant implications for the medical surveillance team, as they can utilise the results to identify unprotected individuals and administer measles and rubella vaccines accordingly. This proactive approach will help reduce biosafety risks associated with working in the laboratory environment.



PP2.097 Sociodemographic factors related to unsafe deliveries in Malaysia: findings from A National Health Survey

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Unsafe delivery are births conducted by non-skilled health personnel. The prevalence of unsafe deliveries was reported as 0.5% in NHMS 2016. This study aims to determine the prevalence and sociodemographic factors related to unsafe deliveries in Malaysia. Data was obtained from the National Health and Morbidity Survey 2022, Maternal and Child Health (NHMS 2022: MCH), a nationwide study that adopted a two-stage stratified random sampling design. Overall, 6,335 women aged between 15-49 years with a child below 2 years old were involved in this survey. Analysis was done via complex sample analyses using IBM SPSS version 28. The survey revealed that the prevalence of unsafe deliveries was 1.6%. Results showed unsafe deliveries were higher among women who never attended antenatal check-up, 67.1% (95% CI:47.22, 82.36) than those who had more than 4 times of antenatal visits, 0.7% (95% CI:0.43,0.99). The prevalence of unsafe deliveries among non-citizen was 20.0% (95% CI: 13.00, 29.54) compared to Malaysian at 0.4% (95% CI:0.24,0.73). Unsafe deliveries were higher in women with no formal education, at 16.5% (95% CI:7.36,33.07) and among private employees at 2.4% (95% CI:1.44,3.90). There was no significant difference in the prevalence of unsafe deliveries by mothers' locality, household income, and marital status. As conclusion, the prevalence of unsafe deliveries has increased from 0.5% in 2016 to 1.6%. These findings provide information to the respective agency in strengthening interventions to improve antenatal visitation to avoid unsafe deliveries.

PP2.098 The association between behavioural addictions and mental health status among public university students in East Malaysia

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Internet and smartphone have become important tools in communication with an increment of its users over the years. The overused of these tools had been investigated to be associated with the mental health status. This study aims to investigate the prevalence of internet gaming and smartphone addictions and its association with depression and anxiety among university students in East Malaysia. A cross sectional study was conducted. Besides sociodemographic characteristics, Smartphone Addiction Scale (SAS-SV) and Internet Gaming Disorder Scale (IGDS9-SF) were used to assess behavioural addictions. While Patient Health Questionnaire (PHQ-9) and Generalized Anxiety Disorder (GAD-7) were used to assess respondents' perceived depression and anxiety. A total of 752 students participated in the survey (males, n=245 and female, n=507). Based on the findings, 40.2% of the respondents have present with depressive disorder and 43.8% with anxiety disorder. About 12.1% respondents shown gaming addiction whereas 31.8% of the respondents shown smartphone addiction. Those with higher smartphone addiction score are significantly more likely to have depressive disorder (OR=2.305, CI [1.685,3.153]) and anxiety (OR=2.906, CI [2.116,3.991]). On a separate note, respondents with higher gaming addiction score also are significantly more likely to have depressive disorder (OR=4.754, CI [2.921,7.737]) and anxiety (OR=4.531, CI [2.754, 7.454]). Overall, the present study shown significant association between behavioural addictions of smartphone and gaming on mental health status among the university students in East Malaysia.

PP2.099 The association between diabetes mellitus and urinary incontinence among elderly in Malaysia

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Diabetes Mellitus (DM) and Urinary Incontinence (UI) are common conditions among elderly, affecting their quality of life. Understanding the prevalence and association between DM and UI is crucial for appropriate management and intervention strategies. This study aims to investigate this association among elderly population in Malaysia. A cross-sectional study was conducted, involving 3,716 elderly individuals aged 60 years and above. Data on Diabetes Mellitus and Urinary Incontinence, as well as relevant sociodemographic were included in this study. Complex sample descriptive analysis was performed to estimate the prevalence of DM and UI with the population. Logistic regression analysis was then conducted to determine the association between DM and UI, while controlling for relevant sociodemographic factors. Among the participants, 1,018 (27.7%) had DM and 190 (5.3%) reported UI. The prevalence of UI was significantly higher in the diabetic group (7.7%) compared to the non-diabetic group (4.4%). Logistic regression analysis revealed a significant association between DM and UI, with crude odds ratio of 1.80 (95% CI:1.29–2.52) and adjusted odds ratio of 1.75 (95% CI:1.27,2.42) after accounting for sociodemographic factors. There is a significant association between Diabetes Mellitus and Urinary Incontinence among the elderly. The findings highlight the increased risk of UI in individual with DM and emphasize the need for proactive screening and management strategies in this population. Further research is warranted to explore the underlying mechanisms and develop targeted interventions to address this important health issue.

PP2.100 The growing threat of non-communicable diseases in Malaysia

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Tackling NCDs is a recognized global priority, with the Sustainable Developmental Goal 3.4.1 monitoring the probability of dying from NCDs among those age 30 to 70 years of age. The aim of this study is to determine the trend of probability of dying from NCDs in Malaysia. Mortality data from 2017 to 2021 was obtained from Department of Statistics Malaysia. Mortality from NCDs included deaths due cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases, among those 30 to 70 years of age. Probability of dying was determine using life table approach. The trend of probability of dying from NCDs was forecasted to 2030 using regression models. The probability of dying from NCDs was seen to have a decline from 2017 to 2019, from 20.0% to 18.8%, with a sharp drop due to the COVID-19 pandemic. The rates were seen to rebound to 19.4% in 2021. Despite the decline, the probability of dying from NCDs is expected to rise in the following years, to 19.4% in 2025, and 20.0% by 2030, driven by increases seen in cancer and diabetes deaths. The increased probability of dying from NCD among the younger age group highlights the need to strengthen the health screening programs in Malaysia. Focus needs to be given to the working age group, through workplace interventions, to combat this rising problem. The rising risk of mortality among the young and productive age group highlights the need to strengthen health literacy, screening programs and preventive measures in Malaysia.



PP2.102 The pattern of IgG antibodies against SARS-CoV-2 nucleocapsid antigen among the recipients of three different vaccine primary series in Malaysia

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Pfizer/BioNTech, AstraZeneca, and CanSino produce COVID-19 vaccines using only materials that induce antibodies against the SARS-CoV-2 spike antigen. However, production of antibodies against nucleocapsid (anti-N) antibodies implies infection. This study aims to describe the patterns of anti-N antibodies after the primary series of three aforementioned COVID-19 vaccines among adults in Malaysia over time. We utilised data from the IMSURE study, a cohort study that recruited 2,513 respondents aged ≥ 18 years from June 2021 to December 2022. Data were analysed, describing the median with 25th and 75th percentiles of anti-N antibody level (in index, an arbitrary unit with range 0-100 and ≥ 1 as positive cut-off threshold) at each follow-up. After a year, the study retention rate was 45%. The anti-N antibody level was generally lower among Pfizer/BioNTech recipients for all follow-ups as compared to other vaccines. After completion of vaccination, the anti-N level was 18.8 (4.3, 78.6), increased slightly at 9-month from the 1st dose- 33.0 (15.0, 71.5), and declined at 12-month- 26.9 (15.2, 62.8). AstraZeneca recipients were comparable to Pfizer/BioNTech recipients, with anti-N level of 23.1 (9.8, 54.6) after completed vaccination, later increased slightly at 6-month to 24.7 (6.1, 72.6), to 42.2 (17.4-88.2) at 9-month, and decreased at 12-month- 34.2 (14.8, 72.9). CanSino recipients had anti-N level of 39.3 (12.0, 101.0) at 28 days post-vaccination, which increased at 6-month to 81.7 (19.0, 146.9), and decreased at 12-month-38.5 (11.5, 124.6). CanSino recipients were more likely to be infected with COVID-19 in this study. These data provide COVID-19 infection trends in the community following vaccination for future planning and decision-making regarding public health vaccination policy.

PP2.103 The performance of SAME-TT₂R₂ score in predicting the quality of anticoagulation control in Malaysian population

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Warfarin is the mainstay oral anticoagulant for stroke prevention in atrial fibrillation (AF). Poor quality of anticoagulation control, with a time in therapeutic range (TTR) $< 70\%$, is associated with increased risk of stroke and bleeding. The Sex, Age, Medical history, Tobacco use, Race (SAME-TT₂R₂) score was proposed as a simple clinical tool to identify AF patients expected to respond poorly to warfarin. The study aimed to investigate the performance of the score in predicting the quality of anticoagulation control in a multiethnic Malaysian population. Data of patients attending the Anticoagulation Clinic in Hospital Tengku Ampuan Rahimah (HTAR) Klang, Malaysia between January to December 2019 was collected retrospectively. The TTR was calculated using Rosendaal method, and the SAME-TT₂R₂ score was determined for each patient. The 388 patients had a mean TTR (\pm SD) was 51.2% (\pm 26.3%), with only 103 (26.5%) patients achieving good quality of anticoagulation control (TTR $< 70\%$). The median (IQR) SAME-TT₂R₂ score measured was 3 (2-4), and 287 (74.0%) patients had a SAME-TT₂R₂ score > 2 . The area under the receiver operating characteristic (ROC) curve showed that SAME-TT₂R₂ score > 2 was not able to discriminate poor anticoagulation control (TTR $< 70\%$) [c-statistic 0.49 (95% CI 0.43-0.56)]. The SAME-TT₂R₂ score did not satisfactorily predict the quality of anticoagulation control of AF patients on warfarin in the clinic. Modifying the score based on culture-specific or socioeconomic factors in Asians may be necessary for the SAME-TT₂R₂ score to be clinically useful in this region.

PP2.105 The prevalence of postnatal depression among mothers in Malaysia: are there any changes after 5 years

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In recent times, there has been an increased risk of postnatal mothers experiencing symptoms of depression due to various factors. The aim of this study was to determine the prevalence of postnatal depression and its relationship with sociodemographic factors among mothers with infants aged 6-16 weeks in Malaysia. Data were obtained from the National Health and Morbidity Survey (NHMS) 2022: Maternal and Child Health, a cross-sectional study which employed a two-stage random sampling technique. The sample size for postnatal mothers was determined using the single-proportion formula. The Edinburgh Postnatal Depression Scale (EPDS), a validated tool, was used for assessment of postnatal depression through self-administration by the respondents. A positive score on item 10 (suicidal ideation) or a total EPDS score of 12 and above were categorised as postnatal depression. The relationship between postnatal depression and sociodemographic factors was analysed using a chi-square test. Overall, 10.4% of postnatal mothers were identified as having a postnatal depression upon screening. The prevalence was higher among single mothers in comparison to married or cohabiting mothers ($\chi^2=9.604$, $p=0.01$). There was no significant difference ($p>0.05$) observed in the prevalence of postnatal depression by household income group, education status, and working status. The prevalence of postnatal depression among mothers was lower compared to a nationwide survey in 2016. However, the figure remains relatively high, emphasizing the need for increased screening of pregnant mothers to identify early signs of depression.

PP2.106 The reasons for vitamin-mineral supplement intake among secondary school students and its correlation with dietary habits and nutrition status

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Prevalence rates of vitamin-mineral supplement (VMS) use among adolescents and the general population are observed to be increasing. This study aimed to determine the association of dietary practice and nutrition status with the reasons for vitamin-mineral supplement intake among adolescents. The Adolescent Health and Nutrition Survey 2017 was a cross-sectional study, employing a two-stage cluster sample design to produce a representative sample of students in government schools. The representatives in this study were 9077 secondary school adolescents aged 13 to 17 years old who reported consuming VMS were included in this study. Descriptive and multiple logistic regression analysis using complex sample was performed for data analysis. The main reasons for VMS consumption were parent's advice (43.6%) and followed by self-awareness (31.7%), doctor's prescription (15.6%), other unspecified reasons (6.8%), and friend influences (2.3%). Using multinomial regression analysis, the expected risks of taking VMS due to doctors, parents, self-awareness, and friends versus other unspecified reasons were higher among adolescents who sometimes experienced hunger, had stunted growth, and were male. The expected risks of taking VMS were lower among Chinese, those who did not take breakfast, and those who eat out daily. Gender, height for age, strata, ethnicity, hunger experience, eating out, and breakfast intake frequency were associated with the reasons for VMS intake. Other dietary behaviour and meal patterns did not show significant associations with the reason for VMS intake. Understanding factors associated with the reason for VMS intake could determine the essential actions for nutrition education on VMS usage, thus promoting healthier dietary habits.



PP2.107 The relationship between physical inactivity and substance use disorders among adolescents in Malaysia

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Smoking, drug use, alcohol consumption, and physical inactivity are often interconnected, with individuals who engage in these behaviours at a higher risk of experiencing negative health outcomes. This study explored the relationships between physical inactivity and substance use disorders. The study utilised data from the nationwide cross-sectional Adolescent Health Survey 2022, with 33,523 school-going adolescents participating in this survey. This self-administered survey used the Global School-based Student Health Survey core questionnaire modules. Physical inactivity was defined as not being physically active for at least 60 minutes daily for five days or more in the past seven days. Descriptive and bivariate analyses were performed using SPSS version 26.0. The prevalence of physical inactivity was 78.6% (95% CI:77.64,79.56), with a significant difference between males (71.9%, 95% CI:70.58,73.19) and females (85.3%, 95% CI:84.25,86.32). Physical inactivity was significantly more prevalent among Bumiputera Sarawak (83.7%, 95% CI:84.25,86.32) and 13 years old students (80.2%, 95% CI:78.61,81.67). By substance use disorders, adolescents who ever drank alcohol (79.9%, 95% CI:78.17,81.61) and never used drugs (78.7%, 95% CI:77.75,79.70) were reported to have a higher prevalence of physical inactivity. In addition, the prevalence of physical inactivity was significantly higher among adolescents that currently not cigarette smokers (78.9%, 95% CI:77.83,79.84) and not e-cigarette/vape users (79.4%, 95% CI:78.34,80.40). Our findings found that adolescents with ever-drunk alcohol, have never used the drug, are not cigarette smokers and e-cigarette/vape users are more likely to be physically inactive. Substance use disorder and physical inactivity are largely incongruent behaviours and are influenced by multiple factors. Therefore, it is essential to interpret these findings with caution and consider the broader context when examining the relationship between high-risky behaviours and physical inactivity.

PP2.108 The relationship between resilience with depression among moral rehabilitation centre students' of Sekolah Tunas Bakti

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Depression was a mental health problem most frequently experienced by adolescents compared to other mental health problems. Adolescents especially those of low social class background who did not succeed academically and were detained in moral rehabilitation centres and at risk of depression. Resilience was seen as an important resource that help to recover from difficult situations and to deal with stress. Individuals with higher levels of resilience experience low levels of emotional and behavioural problems including depression. Considering this idea, this study aimed to assess the relationship between resilience with depression among moral rehabilitation centre students' of Sekolah Tunas Bakti (STB). A cross-sectional study was conducted in August-October 2015 in STB Sg. Besi, Kuala Lumpur and STB Sg. Lereh, Melaka. The sample of the present study consisted of 171 STB students. The age of the participants ranged from 10 to 19 years old. Demographic information forms, Beck Depression Inventory-II (BDI II), and Ego Resilience Scale (ER89) were administered to the students to assess their resilience with the level of depression. Pearson product-moment coefficient of correlation was applied to analyse the relationship between resilience and depression. Analysis of the result indicated that there was a negative significant correlation between resilience and depression ($r=-0.203$, $p<0.01$) in STB students. It means that high resilience could reduce depression. These findings could be used as a guideline when developing intervention programme to improve resilience and reduce the level of depression among STB students.

PP2.109 The role of adulticide as part of integrated vector control management for Aedes-borne diseases

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Aedes-borne diseases, particularly dengue has been an endemic in Malaysia, with various measures and programmes implemented to curb its spread in the community. A novel approach has been introduced in a study, integrating adulticide, larvicide and community engagement activities in controlling aedes-borne disease in Malaysia setting. The objective was to examine post-application quality of K-Othrine® Polyzone spray using cone test evaluation. Three separate standard WHO bioassay cones test was performed using three different mosquitos' strains, i.e., susceptible, lab-resistance, and wild type (BAM Villa (BV) residents). Ten sucrose-fed adult female mosquitoes were inserted into each bioassay cone and were collected after 30 minutes for mortality observation. Survival analysis was applied to measure the mosquito survival rate stratified by strain and adjusted with environmental parameters. Survival was defined for knockdown or censor more than 30 minutes. Knockdown probabilities were significantly lower in lab-resistance and BV groups compared to the susceptible group, with the hazard ratios (HR) of 0.46 (95% CI: 0.37, 0.57) and 0.11 (95% CI: 0.07, 0.16), respectively. The observed associations remained significant with the adjusted HR of 0.43 (95% CI: 0.35, 0.54) and 0.10 (95% CI: 0.07, 0.15) for susceptible and BV group, respectively. Our findings demonstrated that the wild type of mosquito (i.e. BV group) that were expose with K-Othrine® Polyzone spray exhibit the resistance properties, however, pending for further investigation. These findings highlight the importance of considering environmental factors in mosquito control interventions and emphasize the need for ongoing surveillance and targeted strategies.

PP2.110 The studies on *Ae. aegypti* from 1927 to 2022: a scientometric review using text mining

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Ae. aegypti is the vector of dengue, zika, chikungunya, and yellow fever disease. The studies on *Ae. aegypti* began more than hundred years ago. Scientometric study on *Ae. aegypti* is still scarce, and limits to region and short years period. Scientometric study on *Ae. aegypti* on more aspects, including author co-occurrences, citation rate, journal, institution, and funding agencies is necessary. Hence, this study focused on the published articles on *Ae. aegypti* from the years 1927 through 2022 worldwide. The data was extracted using Scopus database. Only articles, reviews, letters, editorials, book, and book chapter were included up to 20 July 2023 (15,586 records) and analysed using VOSviewer. The review articles were only 6.12% while research articles were 90.13%. The



relative growth rate of the publication on *Ae. aegypti* was fluctuated and increased over time. The top authors were Ritchie, S. A. (n=126) and Scott, T. W. (n=123). The main subject areas were animals, aedes, nonhuman, female, mosquito, human and dengue. The top cited articles were published by Halstead, S. B. et. al. in Science (1,315 citations), Kraemer et. el. in eLife (1,191 citations) and Gubler, D. J. et. al. in Trends in Microbiology (1,174 citations). Publications on *Ae. aegypti* were most recorded in Journal of Medical Entomology (741, 7.2%). The researchers could understand the current knowledge gap on *Ae. aegypti* and to plan for future research pathways. This study contributes also to the public health stakeholder in improving the vector control interventions and evaluates the extent of research subject areas.

PP2.111 Translation, cross-cultural adaptation, and validation of the big five inventory-10 (BFI-10) in the Malay language

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The use of short scales to measure personality traits has become increasingly popular. The Big Five Inventory-10 (BFI-10) is a brief self-report questionnaire with ten items, which designed to measure the five dimensions of personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. The study aims to translate and validate with a cross-cultural adaptation of the English version into the Malay language among healthcare providers. A forward-backwards translation of the questionnaire was conducted by three bilingual translators (English-Malay). The cross-cultural adaptation was based on Herdman's and Beaton's guidelines to achieve equivalence. This cross-sectional study recruited 155 nurses from two public hospitals via convenience sampling. The face and content validity of the BFI-10 was examined. Dimensionality analysis was completed using exploratory factor analysis (EFA), followed by the reliability analysis using test-retest reliability. The scale content validity index (S-CVI) was 0.975 for clarity, relevancy, and consistency. All the items had an adjusted kappa value ranging from 0.87 to 1.00, indicating excellent agreement. All the intraclass correlation coefficients of the items are >0.9, indicating excellent reliability. From dimensionality analysis, the personality data collected failed to obtain five distinct personality traits, probably due to acquiescence and social desirability response bias. The Malay short version of the BFI-10 is a valid and reliable tool to assess the personality of healthcare providers in Malaysia. However, it is advisable to use the longer version of BFI in the case of personality-focused research.

PP2.112 Twelve-year temperature and heat wave pattern of three affected regions in Malaysia

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The frequency and severity of heat waves are expected to increase in the future. Malaysia has experienced several heat waves between 2007 and 2018. However, studies on its local impact are still limited. This study looked at temperature and heat wave pattern of Chuping in Perlis, Kuala Krai in Kelantan and Keningau in Sabah which has reported several extreme temperatures events. Climate data was obtained from the Malaysian Meteorological Department (MMD) and hospital admissions were obtained from Ministry of Health. The MMD defined heat wave as three consecutive days of temperature above 37°C and five consecutive days of temperature above 35°C. From 2007 to 2018, Chuping experienced 486 hot days and 26 heat wave events, compared to 439 hot days and 19 heat wave events for Kuala Krai, and 79 hot days and three heat wave episodes for Keningau. All three locations experienced the hottest days in 2016. There was an increasing trend of all cause and respiratory hospital admissions, but there were no admissions for heat related illnesses (HRI). The results showed that 2016 had the most heat waves in all three locations and Chuping experienced the most heat waves and hot days.

However, no HRI was reported during this period and small number of daily cases limited the ability to correlate hospital admissions with temperature. This may be due to underreporting or that patients don't go to hospitals for treatment. Improving reporting and data collection across the healthcare system can allow health impacts to be studied more precisely.

PP2.113 Uncovering the Awareness of Advance Care Planning (ACP) Among Malaysian Public

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Advance Care Planning (ACP) is a vital initiative in developed countries aimed at improving end-of-life care for the elderly. However, the formal introduction and implementation of ACP in Malaysia are currently limited. This study aims to evaluate the awareness and perceptions of ACP among the Malaysian public. A cross-sectional study was conducted using a self-administered questionnaire distributed through Google Forms. Participants included Malaysian individuals aged 18 and above who had internet access and could understand English or Malay. The survey assessed participants' familiarity with ACP and their understanding of the concept. Out of 1,227 respondents, 31.6% had heard about ACP, mostly females (66.8%) and Malays (60.3%). Higher incomes (41.2%) and tertiary education (64.7%) were common characteristics of those familiar with ACP. Among respondents who knew about ACP, 63.9% had insurance and 72.4% understood its meaning. Primary sources of ACP information included healthcare personnel (70.8%), social media (48.8%), and mass media (30.6%). The study revealed higher awareness of ACP among women and individuals with tertiary education, consistent with previous research. Respondent's awareness of ACP led to a notable intention to discuss it in the future, highlighting its relevance for decision-making in times of incapacity. Promoting ACP to the Malaysian public, particularly among those aged 36 to 45, is crucial to ensure widespread access to ACP. This study highlights relatively high awareness of ACP among Malaysians, particularly in specific demographic groups. Efforts to promote ACP and facilitate widespread access are essential.

PP2.115 Unravelling Malaysians' understanding of malaria symptoms: a key element for malaria elimination certification

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Adequate knowledge of malaria symptoms promotes the implementation of prevention strategies, improves health-seeking behaviour, and enhances the sustainability of malaria elimination programs. Thus, this survey aimed to assess the prevalence of accurate knowledge of malaria symptoms and its associated factors among Malaysians. Secondary data were used from the National Health and Morbidity Survey (NHMS), conducted between September and October 2020, involving respondents aged 15 and above. A cross-sectional survey with five structured questionnaires was administered using computer-assisted telephone interviews (CATI). The socio-demographic characteristics of respondents were recorded. Data were analysed using STATA SE Version 16, utilizing chi-square and logistic regression to test associations between variables ($p < 0.05$). Out of 3085 respondents, 2,491 (prevalence: 76.1%, 95% CI: 70.51, 80.94) had heard of malaria. However, only 24.1% (95% CI: 21.18, 27.23) of those who had heard of malaria possessed an accurate knowledge of its symptoms. Rural residents had a higher prevalence (26.5%, 95% CI: 23.30, 29.91) compared to urban residents (23.3%, 95% CI: 19.73, 27.320). Multivariate analysis revealed that older individuals and those with higher education had increased odds of possessing accurate knowledge of malaria symptoms. These findings highlight a remarkably low prevalence of accurate knowledge of malaria symptoms among Malaysians. Educational level, age, and occupation emerged as significant factors associated with an accurate understanding of malaria symptoms. Recognizing malaria symptoms is crucial for early identification, timely treatment, and preventing severe complications. This knowledge empowers individuals, healthcare providers, and communities to combat malaria



and mitigate its impact on public health appropriately.

PP2.116 Unveiling the curtain of cancer delay: understanding factors influencing presentation interval in Malaysia

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Cancer is a global public health burden, especially in low- and middle-income countries (LMICs). In Malaysia, it is the fourth leading cause of death. This study aims to assess factors associated with the prolonged symptom onset to seeking care (patient interval, PI) for common cancers mainly breast, colorectal, nasopharyngeal, and cervical in Malaysia. This multicentre, cross-sectional study enrolled cancer patients from seven public hospital in Malaysia. Data were collected through patient self-administered questionnaires and medical records. A delay in PI is defined as an interval of >30 days. Sociodemographic characteristics, comorbidities, and health-seeking behaviours were analysed with descriptive statistics and multivariable logistic regression. Among 476 participants, breast cancer was the most prevalent (41.6%), followed by colorectal (26.9%), nasopharyngeal (22.1%), and cervical (9.5%) cancers. The overall median presentation interval was 66 days (IQR: 14-180). Age was associated with a lower odds of presentation delay (OR=0.95, 95% CI: 0.93-0.98). Compared to Malay, Chinese patients had 2.34 times higher odds of delay in presentation (95% CI: 1.24–4.55). Patients with secondary or tertiary education were less likely to experience presentation delay compared to those without formal education (OR=0.21, 95% CI: 0.04–0.79) and (OR=0.19, 95% CI: 0.03–0.88) respectively. This study identifies age, ethnicity and education level as potential factors affecting delay in cancer presentation. Understanding these factors is crucial for implementing effective interventions, reducing healthcare burden, and enhancing cancer care in Malaysia.

PP2.117 Urban-rural variation of hypertension and its associated risk factors among Malaysian adults: finding from NHMS 2019

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Hypertension is a global public health concern, and understanding its prevalence and associated factors in different settings is important for targeted interventions. This study aimed to investigate the urban-rural variation in known hypertension prevalence and factors associated using data from the Malaysia National Health Morbidity Survey 2019. A cross-sectional study was conducted among adults aged 18 years and above using multistage sampling. Complex sample descriptive analysis and logistic regression were performed to analyse the data and determine the prevalence and factors associated with hypertension. Of 10,463 participants, the prevalence of known hypertension found to be 17.2% in rural areas and 15.5% in urban areas. However, ethnicity Bumiputera of Sarawak was statistically significant with urban areas. In both settings, age, diabetes mellitus, cholesterol, and obesity showed significant associations with hypertension. In rural, the adjusted odds ratios (AOR) for age, diabetes mellitus, cholesterol, and obesity were 1.08 (95% CI: 1.06-1.10), 4.23 (95% CI: 2.81-6.37), 7.69 (95% CI: 5.75-10.29), and 2.74 (95% CI: 1.08-6.94) respectively. In urban, the AORs for age, diabetes mellitus, cholesterol, obesity, and Bumiputera Sarawak ethnicity were 1.08 (95% CI: 1.06-1.09), 4.51 (95% CI: 3.11-6.56), 6.98 (95% CI: 5.12-9.53), 5.13 (95% CI: 5.13-74.27), and 2.11 (95% CI: 1.26-3.52) respectively. This study reveals a higher prevalence of known hypertension in rural areas compared to urban areas with common factors associated with known hypertension in both settings. Additionally, the association of Bumiputera Sarawak ethnicity with known hypertension was observed in urban areas. These findings emphasize the need for targeted interventions and public health strategies to address hypertension and its associated risk factors in specific urban and rural contexts.

PP2.118 Validation of dynamic TIMI risk score to predict 1 year mortality risk in first-onset myocardial infarction in Malaysians

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The Dynamic TIMI risk score assesses both risk factors upon presentation of the myocardial infarction (MI) event and upon discharge to predict 1 year mortality risk. However, it needs further validation in the Malaysian population before it can be promoted for usage in Malaysia. We followed up first-onset MI participants from the MAVERIK study, specifically including confirmed STEMI participants and assessing mortality within 1 year of the initial MI event. Baseline characteristics were retrieved from the MAVERIK study database and hospital medical records. Subgroup analysis in participants ≤ 50 years old was performed. The validation cohort for the study consisted of 1,041 participants, mostly male (93.76%) and under 50 years old (52.45%). Mortality rates were highest in the high-risk participants (12.23%), followed by moderate-risk (6.91%) and low-risk participants (2.74%). Within one year, 5% participants died, of which 92% of these deaths were cardiovascular-related. The Dynamic TIMI risk score demonstrated moderate predictive ability for one-year mortality with a C-statistic of 0.68 (95% CI 0.61–0.75) and adequate calibration ($p > 0.05$). Improved discrimination ability in those ≤ 50 years old (C-statistic 0.70, 95% CI 0.60–0.80) was observed with adequate calibration ($p > 0.05$). Risk associations were generally similar to those observed in the Dynamic TIMI risk score derivation cohort. The Dynamic TIMI risk score shows potential applicability to Malaysians. However, the findings of the study were limited in the inclusion of several variables and there were insufficient events observed for recurrent MI to establish reliable risk associations.

PP2.119 Validation of the measurement of health literacy among adolescents' questionnaire (MOHLAA-Q)

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It has been determined that health literacy (HL) play significant factor in health and become essential element in health promotion. Mostly, HL instrument were designated to assess HL for adults' population, whereas only few for adolescent. To assess the HL of this population, researchers have been focussing on developing instruments to measure their HL. Thus, utilising validated instrument to assess HL is essential for success in promoting HL from early stage of age. The purpose of this study is to validate health literacy assessment tool for adolescent using Measurement of Health Literacy Among Adolescents' Questionnaire (MOHLAA-Q). MOHLAA-Q is developed in German to assess self-reported general health literacy among German-speaking adolescents. Face validity and content validity were done for MOHLAA-Q on its 29 items of question. MOHLAA-Q divided to 4 sections consist of A) Information about Health, B) Communication about Health, C) Attitudes towards Health & 4) Knowledge about Topic Related to Health. The internal consistency coefficients (Cronbach's) of the scales A-C varied from 0.61 to 0.81. In pilot testing, administration took ~15 minutes with 229 respondents from rural and urban area. The questionnaire is validated for Malay and English-speaking adolescents age between 13 to 17 years old. The MOHLAA-Q offers researchers a brief validated measurement tool that can be used to assess adolescent health literacy. This validated tool of HL will provide a piece function of health research to the people.

**PP2.120 Trends and mortality outcomes of patients with COVID-19 in critically ill patients in Malaysia**

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Severe COVID-19 infection is associated with exceptionally high mortality rates which may vary according to the predominant circulating variants. This study aims to assess independent risk factors associated with mortality in COVID-19 patients admitted to intensive care units (ICU) in Malaysia. This retrospective cohort study included all COVID-19 patients admitted to the ICU before January 22, 2023. Patients' characteristics, comorbidities, viral variants, vaccination status, and clinical conditions during ICU admission were analysed, with all-cause mortality as outcome using multivariable logistic regression. Of the 32,059 patients included in this cohort, the median age was 57 (IQR: 46-66) years old. Majority were men (58.5%), 74.9% of patients had ≥ 1 comorbidity, and 71.9% with partial vaccination. Overall COVID-19 ICU mortality rate was 46.1%. The highest was observed during the Delta predominant period (54.7%), followed by Beta predominant (45.4%), Omicron predominant (41.7%) and the initial COVID (26.7%) periods, respectively. Those with retroviral disease (OR=3.15 95% CI 2.18, 4.56), lung disease (OR=2.13 95% CI 1.96, 2.31) and kidney disease (OR=1.97, 95% CI 1.82, 2.13) were twice as likely to succumb. The risk of mortality increased significantly with age. The study confirmed that the high ICU mortality rate of COVID-19 was primarily due to patient factors such as age and underlying comorbidities, regardless of COVID-19 variants. The exceptionally high COVID-19 ICU mortality observed during the Delta predominant period could be attributed to healthcare burden, such as ICU capacity and access, which require further investigation.

POSTER PRESENTATIONS: HEALTH SYSTEM AND MANAGEMENT

PP3.01 Evaluate clinical judgement among nurses in public hospital, Malaysia using SBARe tool: a qualitative research

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Effective communication is critical in healthcare for relaying information, expressing emotions, and building relationships. The SBARe (Situation, Background, Assessment, Recommendation, and evaluation) tool is a standardized communication technique used in healthcare settings, but its effectiveness in Malaysia is understudied. This qualitative study aimed to evaluate the clinical judgment of nurses using the SBARe tool, explore their views on its use during report handovers, assess its applicability in their routine, and gauge nurses' communication, knowledge, and readiness in using SBARe. Fifteen nurse leaders from Malaysia's largest public hospital were purposively sampled and interviewed using the narrative method. Thematic Analysis and ATLAS.ti were employed for data analysis and coding. The study revealed that nurses using SBARe demonstrated effective and efficient clinical decision-making, improved patient information analysis, care prioritization, and decision-making. SBARe was perceived as efficient, timesaving, practical, and capable of enhancing communication and preparedness during report handovers. The tool facilitated concise and accurate information exchange, minimizing errors. The study recommends implementing SBARe in all hospitals and providing continuous training for nurses. Implementation can optimize resource utilization, improve clinical decision-making, reduce errors, and save time during report handovers. Nurses' positive response to SBARe's simplicity and straightforwardness supports its widespread adoption. In conclusion, this study highlights the effectiveness of the SBARe tool and its potential to enhance communication and patient care in Malaysian healthcare settings.

PP3.02 Aligning key performance indicators with lean sustainability: results from a scoping review

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Though lean has attracted considerable interest from health organizations, sustainability remains difficult to achieve. Literature reviews have associated the importance of monitoring and evaluation in the sustainment of lean. Formal evaluations are needed to monitor the effectiveness and efficiency of the improvements. A common approach is by using the key performance indicators (KPIs). Therefore, this review will examine the types of KPIs used in the sustainability of lean. This analysis is part of a scoping review to identify factors influencing lean sustainability in healthcare. The databases used were Emerald Insight, Ovid Medline, Pubmed and Google Scholar with backward citation searching. The retrieved articles were analyzed using thematic analysis. One of main themes emerged from the scoping review is "Monitoring and Evaluations (M & E)". Under the M & E theme, five subthemes were discovered: (i) auditing and feedback (ii) data management (iii) documentation (iv) KPIs and (v) process outcome measurement. Most of the articles emphasized on the role of key performance indicators in sustaining lean. From the analysis, the types of KPIs were related to waiting time, bed-turnaround time, length-of-stays, facilities and appointment capacities, number of cancelled interventions and size of inventory. Overall, the reported KPIs in this review are heterogenous which made it difficult to recommend the specific indicators to be used for sustaining lean. However, a few key points can be drawn such as benchmarking with the right performance indicators aligned with the organisation's objective and instituting a monitoring system are key factors in lean sustainability.



PP3.03 Assessing the inequality in out-of-pocket health expenditure among the non-communicable diseases and non-NCD in Malaysia: a blinder-oaxaca decomposition analysis

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Financial hardship is measured by catastrophic health expenditure (CHE), when out-of-pocket (OOP) health expenditure (HE) exceed a household's ability to pay. Predicted cost increases for those with non-communicable diseases (NCD) thus present an opportunity to develop catastrophic spending. This study aims to identify the inequality in OOP HE between NCD and non-NCD, and the associated socio-economic factors that influence the difference in OOP spending. Data were obtained from the 2019 Malaysia National Health Morbidity Survey, a total of 10,878 households were analysed using Stata version 14.0. Inequalities in relative OOP (ROOP) spending to annual household income, and absolute OOP (AOOP) the actual annual spending for HE was measured using concentration indices (CI) and curves. A Blinder-Oaxaca decomposition analysis was used to explain the inequality in health outcomes between the two groups (those with and without NCD), and associated factors that lead to the discrimination in OOPHE (differential effects). People with NCD experience a higher financial burden in AOOP (average RM 866.72) compared to non-NCD (RM 426.96). The distribution of ROOP was higher among the poor, with CI (-0.535) for NCD and (-0.417) for non-NCD. There is 3.07% gap in ROOP, where 50.44% attributed to explained factors and 49.54% by unexplained factors. The age group, education, economic, and employment status were the socio-economic factors that significantly contribute to overall inequality differences. The inequality shown in study echoes the need to improve health coverage and financial incentives to cushion NCD patients from experiencing CHE.

PP3.04 Attitude and intention towards ACP among Malaysian public

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Advance Care Planning (ACP) empowers individuals with the preference of end-of-life medical treatments and care and to communicate these preferences to their families and healthcare providers should he or she becomes incapable of making medical decisions in the future. Widely received and supported by law in developed countries, there is a need for a formal nationwide ACP initiative in Malaysia. The cross-sectional study assesses the attitude and intention of the Malaysian public towards ACP via self-administered questionnaires. Based on 1,227 respondents, 86% (1055) agree that ACP should be available in healthcare facilities with 88.6% (1086) agreeing that ACP discussion would be useful for them. Result also shows that 78.9% (968) have the intention to have ACP discussion in the future while 4.6% (56) do not and 16.5% (203) do not know. Among those who have positive attitude towards ACP, 80.5% (856) have intention to discuss ACP in future. In conclusion, ACP programme in the country could be focussed on early adopters while also taking into consideration individual preferences and training of healthcare providers to ensure success of the programme.

PP3.05 Life experience on related events and advance care planning (ACP) for end of life: findings from an online survey

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Advance Care Planning (ACP) provides individuals with the opportunity to express their preferences for future medical treatment, aiming to improve end-of-life quality. However, ACP has not been formally introduced in Malaysia due to the lack of supporting legislation. To investigate the lived experiences of the public and their perspectives on the importance of implementing ACP, a cross-sectional design was employed, utilizing an online survey. The survey aimed to gather responses from Malaysians aged 18 and above residing in Malaysia, conducted between March and April 2022. The survey link was distributed through private and government databases. Among the 1,227 Malaysians who completed the online survey, 70.8% reported involvement in treatment decision-making, and 40.2% had personal experiences with close relatives or friends requiring life-sustaining treatment. Furthermore, most respondents had been hospitalized (65.7%), provided care for critically ill family members or acquaintances (66.6%), and witnessed the passing of family members or acquaintances (89.8%). Considering their previous experiences, a significant percentage of respondents (92.4%) believed that having early care preferences discussion while patients are still healthy is important. This would foster a shared understanding between patients and healthcare professionals regarding potential future care requirements. In conclusion, the implementation of ACP in Malaysia is crucial to uphold patient autonomy and ensure that healthcare decisions align with the individual's wishes. This would also alleviate the burden on family members who often face difficult decisions without clear guidance from their loved ones.

PP3.06 Barriers in Completing Compulsory Talent Grooming Program (TGP) Project: Participants' Perspective.

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TGP Project is a compulsory component to be completed during the training period of the MOH leadership development programme. It aims to instil research interest and skills in participants, allowing them to be more competent in executing research and implementing its findings. However, it is the main obstacle for many talents towards completing TGP. Thus, a qualitative study was conducted to explore the barriers encountered while conducting the TGP project. Between September 2019 and March 2020, 57 TGP talents and supervisors were purposely selected to participate in in-depth interviews and focus group discussions. The interviews were audio-recorded and transcribed verbatim. NVivo 12 software was used for coding analysis, and TGP Registry was used for data triangulation. Three major challenges that participants faced in completing their TGP project emerged: individual reasons, project planning and execution, and workplace challenges. Individually, the participants admitted that they did not all have the necessary knowledge, experience, and skills to conduct full-fledged research of high scientific merit as anticipated. Next, some mentioned that they had difficulties in determining the scope of the project, managing the project, and presenting the findings to the stakeholders. Time constraints caused by ongoing work commitments further stall their project. In view of these challenges, several steps have been taken in the TGP restructuring, including broadening the scope of acceptable projects and appointing project mentors. It is hoped that TGP participants will be trained to become future MOH leaders capable of synthesising and practising evidence-based decision making.

**PP3.07 Cancer impacts on out-of-pocket expenses: the patient perspective**

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Cancer patients often face substantial out-of-pocket (OOP) expenses, which are increasingly recognised as having a serious societal impact. This study aimed to estimate OOP medical and nonmedical costs incurred by cancer patients in the lower income group, disaggregated by the stage of cancer. A total of 430 cancer patients undergoing treatment were recruited from six cancer centres in Malaysia. Retrospective self-reported data on patient and their families' expenses incurred during cancer diagnosis and treatment were collected. These expenses include medical (such as consultations, procedures, and medications), and nonmedical costs (such as transportation, childcare and supplemental food). The 38.6% of the participants were aged between 50-59 years old, with a mean age of 59.8 years, and 78.4% were unemployed. Of the participants, 139 and 202 were diagnosed with stage III and IV cancer, respectively. The annual median OOP medical spending, disaggregated by cancer stage was as follows: stage I (RM633), stage II (RM706), stage III (RM1,020), and stage IV (RM1,170), while the median OOP nonmedical spending was: stage I (RM2,870), stage II (RM2,000), stage III (RM3,026), and stage IV (RM2,614). Overall, cancer patients and their families spent 48% and 18% of their annual income, respectively, on total OOP cancer expenses. This study highlights the cancer-associated costs and the significant financial burden they place on affected individuals and their families. Therefore, implementing measures such as health insurance and supportive services would be beneficial in mitigating some of these costs and reducing the financial burden especially for advanced cancer stage.

PP3.08 Capacity building in sustaining lean healthcare: a scoping review

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Lean has gained significant interest from many health organisations worldwide, but its sustainability is still challenging to attain due to various reasons. It is crucial to comprehend the elements that might foster long-term sustainability to reap the rewards of the significant investment in lean. Hence, this presentation will highlight the importance of capacity building as part of the success factors in sustaining lean. A scoping review that includes any categories of research related to the critical success factors impacting lean sustainability in healthcare was conducted. Databases used were Emerald Insight, Ovid Medline, PubMed, and Google Scholar where backward citation method was used and the PIO (Population, Intervention and Outcome) framework was applied. Thematic analysis was done to analyse the retrieved articles. This study highlights eleven major themes from the forty retrieved articles on success factors influencing lean sustainability. This presentation emphasizes on the value of capacity building as an essential element in maintaining lean. Soft skills, competency, lean champions, and expertise are the main subthemes that forms capacity building. A continuous training to lean implementors, equipping lean knowledge to all level of staff, development of lean champion to guide others and enhancing soft skills for lean implementors were among the examples for capacity building in lean. This assessment emphasises on the importance of capacity development in sustaining lean in the healthcare services. To boost lean sustainability, health organisations should strengthen lean capacity building in line with the momentum of lean practices in their organisation.

PP3.09 Catastrophic out-of-pocket expenditure (OOPE) among Malaysians

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Catastrophic out-of-pocket expenditure (OOPE) can cause severe financial hardship and impede access to quality healthcare services, especially for people with comorbidities. This study assessed the utilisation of healthcare, OOPE, the incidence of catastrophic OOPE among National Health and Morbidity Survey (NHMS) 2019 respondents. The NHMS 2019 data, consisting of 11,674 respondents aged 18 and above, were analysed. Comorbidities were defined as self-reported diabetes, hypertension, and hypercholesterolemia. Catastrophic OOPE was defined as healthcare OOPE exceeding 10% of household income, as defined by the World Health Organization. Of the respondents, 30% reported having comorbidities. Among them, a notable proportion of 26.1% utilised healthcare, with 48.8% reported experiencing OOPE. The average annual OOPE among respondents with comorbidities was RM 5,562 ($\pm 46,608$), fivefold higher than those without comorbidities. Additionally, the study revealed a higher incidence of catastrophic OOPE among respondents with comorbidities and OOPE, with a rate of 30.3% at the 10% threshold. This incidence was more than double the rate observed among respondents without comorbidities (13.4%). The findings highlight significant healthcare challenges faced by respondents with comorbidities. These respondents faced higher OOPE compared to those without comorbidities. The higher OOPE observed among respondents with comorbidities than those without suggests a potential correlation between comorbidities and increased healthcare utilisation, leading to higher OOPE. The higher incidence of catastrophic OOPE among individuals with comorbidities than those without, further emphasises the financial risks this group faces and the need for equitable access to affordable healthcare and appropriate financial protection measures.

PP3.11 Discerning characteristics of perceived unmet needs among middle-aged and older adults in Malaysia

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Malaysia is projected to achieve the ageing nation status by 2050, whereby more than 15% of the population will be over 65 years old. Recent findings from a systematic review and meta-analysis revealed that 10.4% of older population had unmet needs for healthcare. Understanding unmet needs for middle-aged and older adults can facilitate planning and delivery for services as the population ages. This study aims to describe the prevalence and characteristics of middle-aged and older adults in Malaysia with perceived unmet healthcare needs. Secondary data analysis from National Health and Morbidity Survey (NHMS) 2019 was conducted using STATA 14 and sampling weight was applied. Adults aged 45 and older ($n=1,425$) were included in the study. Perceived unmet needs refers to respondents that responded yes when asked if it was necessary to seek treatment/medication or advice from healthcare practitioner for recent acute illness in the past 2 weeks prior to interview but did not seek any treatment/ medication or advice. Overall, 24.5% (95% CI: 17.43-33.18) of middle-aged and older adults in Malaysia reported perceived unmet needs. By gender, this was higher among men 27.5% (95% CI: 19.94-36.64). By socioeconomic status, individuals with low socioeconomic status were found to have highest perceived unmet needs (27.6%; 95% CI: 19.53-37.56). Our study found unmet needs among middle-aged and older adults in Malaysia, and this differs across gender and socio-economic status. This highlights the importance of further understanding regarding their healthcare needs and barriers for care.



PP3.12 Element of discussion, method of recording and whom to appoint as decision maker for advance care planning

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Advance Care Planning (ACP) is defined as enabling individuals to define goals and preferences for future medical treatment and care, to discuss these goals and preferences with families and healthcare providers, and to record and review these preferences if appropriate. ACP discussions can allow patients to be treated in a way that maximizes their quality of life while respecting their choices, values, and preferences. Without documentation of ACP, it may result in medical actions inconsistent with patients' preferences, worsening patients' quality of life and increasing stress on surrogate decision-makers. Appointing a decision maker allows them to create a preference and make it known to their spouse, family members and others and gives peace of mind to their caregivers when they cannot express their wishes. The study utilised a self-administered questionnaire distributed using Google Form conducted among the Malaysian public. 1,227 respondents answered the questionnaire. Most of the respondents are married, and the Malay race was the highest respondent above all. Majority of respondents would like to discuss the place of care (%), CPR (%) and ventilation machine (%). Written documents are the highest choice on the method of recording (90.2%) while spouse is the preferred decision maker (51%). Therefore, the result of the study can be used as a guide in creating future policy and planning an appropriate strategy to promote ACP uptake.

PP3.13 Empowering cluster hospitals through action research training

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Institute for Health Management (IHM) has been appointed as a trainer for Action Research (AR) in the Ministry of Health (MOH) since 2000. In MOH, AR is used to create change and enhancement of health services delivery. Unlike other ministries such as Ministry of Education, MOH used AR to empower teachers in improvising teaching methods. Beginning 2012, AR is known for its application in Cluster Hospital (CH) initiative aimed to tackle congestion issues and limited specialist services in rural hospitals. This paper aims to share IHM's training experiences related to AR activities in CH initiative. Manual searches were performed to acquire the relevant sources and information for this presentation. The information was sourced from a range of literature such as reports, articles, guidelines, power point presentation, handbooks, databases of IHM's activities in CH and publication related to AR in CH initiative. 42 CHs were trained and given ongoing consultation by IHM. For the past five years, 83 activities have been conducted, including training, seminar, on-site and clinic consultations, continuous medical education (CME), poster and oral presentations, and discussion sessions. Numerous publications and scientific presentations highlighting AR were also produced. IHM has facilitated numerous AR training for healthcare workers in delivering better healthcare services. AR has been used as the main tool in the implementation and expansion of 42 CH. Based on past experiences, AR can be a valuable tool in empowering healthcare workers to create change for the betterment of service delivery and its use can be expanded to other initiative as well.

PP3.14 Extreme gradient boosting (XGBoost): dissecting the machine learning technique in predicting cervical cancer screening utilisation among Malaysian adults' women

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Machine learning (ML) is gaining traction in providing solutions to classification-based situations that are common in healthcare. Extreme gradient boosting (XGBoost) is a relatively new technique in ML that has demonstrated good performance in classification-based scenarios. The objective of this presentation is to demonstrate the usage of XGBoost technique in predicting a classification-based issue, using cervical cancer screening utilisation among Malaysian adults' women as an example. A total of 5,682 samples, with seven socio-demographic features were selected using the National Health and Morbidity Survey 2019 (NMRR-18-3085-44207) dataset. The dataset was split into training and test set, with a ratio of 80:20. Cross validation was performed on the training set using 10-fold validation technique. The algorithm built using the training set was then tested on the test set. The performance metrics were then measured, namely accuracy, F1 score, Receiver Operating Characteristics (ROC) curve, and Area Under the Curve (AUC). XGBoost showed moderate to good in all the performance metrics, namely accuracy (67%) F1 score (71.3%) and AUC (66.2%) in predicting cervical cancer screening utilisation. XGBoost is an ensemble-based learning technique, which has several advantages that contribute to its prediction performance. By combining multiple weak learners into a single strong learner, ensemble-based learning algorithms can frequently achieve greater accuracy and generalisation performance. Its flexibility and robust nature in algorithm building also allow this technique to handle complex and noisy data. XGBoost has the potential to be utilised in understanding health issues in the Malaysian context, depending on appropriate data and objectives.

PP3.15 Has public-private partnership (PPP) enhanced Malaysia's primary healthcare (PHC) service delivery?

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The Malaysian government has been adopting Public-Private Partnership (PPP) into practise since the 1980s, and it has shown encouraging results in the delivery of public facilities. PPP is a collaboration between the public and private sectors to carry out a project or service that is typically handled by public sector. The current study aims to assess whether Malaysia's primary healthcare service delivery has improved as a result of the Medical Equipment Enhancement Tenure (MEET) programme, one of the government's PPP initiatives introduced in 2014 for maintenance of medical equipment used in Primary Healthcare (PHC) facilities. The team members, who were researchers and programme owners, reviewed technical documents, notably the Key Performance Indicator (KPI), to assess the achievement of provider's services between 2015 and 2021. KPIs for MEET include response time, repair time, scheduled maintenance, and uptime guarantee where each KPI is considered achieved if the maintenance is completed within the predetermined time frame. According to the analysis, the KPI performance (%) for maintaining biomedical equipment under the MEET programme has grown steadily (55–100%) during the specified period. Overall, this study indicates that the MEET programme has enhanced Malaysia's PHC service delivery via KPI accomplishments. Therefore, a programme like MEET should be continued in the future since having medical equipment that is in decent condition is crucial for providing better care to the public.



PP3.17 Illuminating surgical excellence: harnessing risk-adjusted CUSUM for dynamic surgeon performance monitoring

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Surgeon performance monitoring is vital for ensuring optimal patient outcomes. Traditional methods often overlook variations in patient risk factors, leading to biased assessments. Recognising inherent patient risk, we delve into the development of the Risk-Adjusted CUSUM by Steiner et al. A retrospective analysis was conducted using data from the Cataract Surgery Registry spanning 2017-2022. The baseline risk of posterior capsule rupture (PCR) was estimated using performance data from 2017-2020, and CUSUM charts were constructed for 2021-2022 performance data. Patient risks associated with PCR were identified through a comprehensive literature review and discussions with Subject Matter Experts. Four different risk modelling methods, including Logistic Regression, Lasso Regression, Ridge Regression, and Random Forest, were compared. CUSUM analysis was applied, accounting for variations in patient risk scores derived from the final risk model. Logistic Regression was selected as the best model for PCR risk with a model accuracy of 70%. The performance of two trainee surgeons was illustrated using CUSUM charts. Surgeon A's chart triggered multiple signals, indicating persistent quality deficits, while Surgeon B's chart showed no signals during the entire monitoring period. These findings were further verified and discussed with the board of trustees overseeing trainee cataract surgeons. By considering patient risk factors, risk adjusted CUSUM enables fair and meaningful comparisons among surgeons. Implemented effectively, it serves as an early warning system, triggering interventions when performance exceeds acceptable bounds. These findings contribute to the growing repertoire of performance monitoring methodologies, empowering healthcare institutions to optimise surgical outcomes and improve patient care.

PP3.18 Featuring REDCap mobile app in National Health and Morbidity Survey (NHMS): a lesson-learned

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The Institute for Public Health (IPH) conducts the National Health and Morbidity Survey (NHMS) to track the health of the households in Malaysia. Previously, the surveys were conducted using the Survey Creation System (SCS), a tablet-based computer programme. Following extensive trials, IPH successfully developed a new data collection system based on the Research Electronic Data Capture (REDCap) platform. For the first time, the REDCap Mobile App (RMA) will be deployed on Samsung Galaxy Tablet S2 (S2) and Samsung Galaxy Tablet S8+ (S8+) devices to gather data for NHMS 2023: Noncommunicable Diseases (NCD) and Healthcare Demand (HCD). The goal of this case study is to discuss the lessons learned during the development process, namely the difficulties faced and troubleshooting methods. During several pre-tests and pilot runs, we discovered that RMA encountered issues due to its limitations and the operating system of the tablets, especially the S2, which included failures in executing complex algorithms and multi-layer nested IF calculations, as well as missing data in the @CALCTEXT action tag's function and some embedded field formats. Consequently, this disrupted its branching logic directives. To address these challenges, we reduced advanced complex algorithms to simpler and more traditional features, provided extensive training and technical support for field staff, and implemented continuous monitoring of the system to troubleshoot problems in a timely manner. These measures are critical to ensure the data collected in the future successfully meet the objectives of NHMS 2023: NCD and HCD.

PP3.19 Leader's role in lean healthcare sustainability: a scoping review

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Lean sustainability is still an issue in health organisations. Studies have documented it, noting lean improvements reverting to their initial state over time. Similarly, hospitals in the MOH have difficulty maintaining the required persistent condition of lean. Due to a lack of study on the long-term viability of lean, little is known about whether lean is sustained inside hospitals and the critical success factors influencing its long-term sustainability. Hence, this presentation will highlight on the role of leaders as one of the critical success factors for lean sustainability. Scoping review was conducted to identify the critical success factors affecting lean sustainability in healthcare. The searches were formulated using the PIO (Population, Intervention and Outcome) framework with PubMed, Emerald Insight and Google Scholar as the search engines. Thematic analysis was used for analysing the retrieved articles. There were forty articles found that were related to the factors influencing the sustainability of lean in healthcare. The research highlighted eleven major themes, with this presentation focusing on one of them: Leadership. Leadership has eight sub-themes identified: role model, site visit, internal lean leader, coach and support others, dedication, qualification, problem solving, and opportunity for leadership. This presentation emphasizes on the significance of leaders as a critical success factor for lean sustainability. Findings shows that the leader is responsible for overseeing the rapid improvement event as well as all areas of planning, process change, follow-up, and sustainability.

PP3.20 Mobilization of the community in support of health awareness for Orang Asli in Kelantan

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Understanding disease prevention and treatment among indigenous people is something complex and multidimensional due to differences in socio-economic status, geographical factors, culture, beliefs, experiences, and way of life. This study was conducted to gain an understanding of health care behaviours among the Orang Asli community in Kelantan. This qualitative ethnography study was conducted using snowball sampling technique. A total of 26 respondents were interviewed based on the content of the semi-structured interview guide. The thematic analysis shows that most of the Orang Asli population of Kuala Koh practice low levels of health care. This phenomenon is associated with poverty, limited living space, low personal hygiene, poorly organized environment, environmental pollution, and malnutrition. Difficulty in obtaining health access, lack of health promotion information and poor communication with health personnel increase the gap to get better health services compared to non-Orang Asli communities. The results show that the importance of individual, socio-economic, cultural, geographical, as well as experience factors in obtaining health services affect health care behaviour among the Kuala Koh Orang Asli community. Understanding the needs and provision of health services that are sensitive to the culture of the Orang Asli community is important to encourage them to be involved in empowering a better health care culture. The government should provide a guideline related to the method of providing treatment to the Orang Asli community by understanding their cultural diversity and beliefs so that the health workers involved can provide services effectively through training that can be provided based on modules will be formed.



PP3.21 Navigating the streams: an exploration of factors influencing capacity building in health policy and systems research

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Building capacity in health policy and system research (HPSR) is crucial for addressing health systems challenges and improving health outcomes. However, a complex interplay of factors shapes the agenda for capacity building in HPSR. This study, guided by Kingdon's Multiple Streams Framework, explores how the problem, policy, and politics streams influence this agenda, focusing on its impact on researchers. We employed an exploratory qualitative study and conducted in depth interviews with 16 participants, which included researchers, healthcare providers, academicians, health policymakers, community leaders, and health advocates. Interviews were audio recorded, transcribed, and analysed according to Kingdon's three streams, using NVivo version 11. Analysis suggested interconnected challenges across three streams influencing HPSR capacity building. In the problem stream, misalignment in understanding roles, constraints, and processes between researchers and policymakers and limited policy awareness created barriers to effective problem identification. Challenges emerged in coordinating local strategies with broader policy goals in the policy stream, suggesting that researchers need a deeper understanding of policy formulation, development, and implementation processes. The politics stream emphasised the complexity of navigating the political aspects of policymaking, highlighting the necessity for improved political skills among researchers. The study highlights the complex interplay between problems, policy, and politics streams in shaping the capacity-building agenda for HPSR. The findings underscore the need for comprehensive capacity-building initiatives in HPSR that impart knowledge of health systems and policy development and equip researchers with enhanced communication, understanding of policy processes, and political acumen among researchers and other stakeholders.

PP3.22 Optimising cost in X-ray services: insights from cost saving analysis between digital X-ray and printed X-ray film use in health clinics in Kuala Pilah Health District

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This study presents an economically efficient approach implemented in health clinics through the adoption of digital X-rays, aimed at optimizing resource allocation and improving accessibility to quality healthcare services. The initiative aligns with the goal of patient-centred care and innovative solutions. A cost saving analysis was conducted to compare the expenses related to printed X-ray films and the implementation of digital X-rays within Kuala Pilah Health Clinic and Juasseh Health Clinic, both operating under the Kuala Pilah Health District Office. The analysis covered a two-month period, specifically May 2023 and June 2023. Selected X-rays were viewed digitally in accordance with predefined inclusion and exclusion criteria. A secure image transfer and display protocol was implemented to ensure the safe handling and transfer of X-ray images. Both clinics combined demonstrated average monthly savings of RM 637, with an estimated annual savings of RM 7,644. The ratio of printed films to digital X-rays was 34:7 for both clinics. The adoption of digital X-rays yielded some advantages. It facilitated cost savings by reducing the need for x-ray films, associated printing costs, and film storage requirements. Furthermore, the digital format allowed for efficient image sharing, remote consultations, and collaborative decision-making, resulting in improved patient care and timely diagnoses. By reducing reliance on printed films and embracing digital imaging, healthcare providers can optimize resource allocation and achieve cost reductions. These results offer valuable insights for healthcare administrators in developing cost-effective strategies for X-ray utilisation.

PP3.23 Perception of health-care workers in providing health care in the emergency department green zone At Hospital Tengku Ampuan Rahimah, Klang

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Overcrowding in the emergency department has been one of the key problems impeding appropriate, timely, and effective hospital care. Provision of non-emergency care in the Emergency Department (ED) are producing congestion in most of the major hospitals with high number of patients. In order to address the overcrowding at ED green zone Hospital Tengku Ampuan Rahimah (HTAR), we conducted a qualitative study of content analysis to explore the health-care workers' (HCWs) perception related to overcrowding and long waiting hours to get treatment in the ED green zone HTAR. Semi structured face-to-face in-depth interviews were conducted with 11 HCWs from HTAR. Participants were recruited from various designations from ED to include a range of health care providing experiences. As follows, five types of perceptions were extracted from the interviews are follows: (i) insufficient knowledge among public about function of ED and the diseases that should be treated in ED, (ii) ED often referred as 'one-stop centre', (iii) lack of staff in all profession categories, (iv) further investigation takes time due to complex disease which requires expert evaluation, and (v) management issues such as limited number of staffs, facilities and work process. In overall to address the overcrowding issues in ED, it is crucial to empower public knowledge on function of ED and make wise decision in choosing rightful health care services, increase efforts to provide good working environment as well as address adequate staffing, facilities, and create pathway for collaboration with private clinics/ hospitals to reduce treatment costs for non-urgent cases.

PP3.25 Population perception of services in the public and private hospitals in Malaysia

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The changing disease burdens and demographic transitions necessitate healthcare service reorientation and increased demand for quality care, highlighting the importance of analysing community perceptions for insights into healthcare effectiveness, accessibility, and quality from the users' perspective. This informs decision-making, service planning, and patient-centred care; enabling policymakers to identify gaps, address barriers, and tailor interventions for specific population needs. This analysis aimed to measure and compare the perception of services in public and private hospitals in Malaysia. Secondary data analysis was conducted on the National Health and Morbidity Survey (NHMS) 2015 dataset, which was the only and most recent dataset with the populations' perception on healthcare services. Individual items of perception from 19,959 respondents were grouped into measures of technical, interpersonal, access quality and affordability. Descriptive statistics and t-tests were used in the subgroup analysis. Findings revealed that the overall impression of public hospitals was better as compared to private (80.4% vs 72.5%; $p < 0.01$), but private hospitals were perceived to have better technical, interpersonal, and access quality. The public hospitals' better overall impression appeared to be highly influenced by affordability. Differences in perception were observed between populations of different residential areas, education levels, and wealth quintiles. Findings from this study provide valuable perceived insights for improvements in service delivery for both sectors. A repeat data collection on population perception is highly recommended in the next NHMS, as a measure of perceived progress for services in Malaysian hospitals after a decade.



PP3.26 Prevalence and utilisation of private health insurance in Malaysia: findings from 2019 National Health Morbidity Survey

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In a 2015 National Health Morbidity Survey (NHMS), only 43.3% of Malaysians had private health insurance (PHI). As a supplementary financial health coverage, PHI play an important role to alleviate financial distress. This study aimed to determine the prevalence and utilizations of PHI in inpatient and outpatient care in Malaysia. We analysed data involving 10,878 respondents above 18 years old from the 2019 NHMS using STATA version 14. Descriptive statistics were used to calculate the overall prevalence of PHI and its utilization in public and private facilities. Overall, 37.3% (n=4,052) respondents had PHI in 2019. PHI was more prevalence among men (54.5%), married individuals (71.9%), age between 35-39 years old (15.8%), Malay (58.3%) and individuals with secondary education (35.1%). From all respondents, 10.3% received outpatient care in the last two weeks. Of these, 72.4% received care from outpatient public facilities, however only 2.1% covered by PHI. In contrast, from 27.6% who received care at private facilities, 8.7% covered by PHI. For inpatient care, 6.5% respondents received care in the past one year. Of these, 80.9% received care from public facilities, with only 2.1% covered by PHI. Among the 19.1% who received care from private facilities, 52.6% covered by PHI. In Malaysia, the proportion of population covered by PHI remains low. Mechanisms that encourage PHI enrolment, such as affordable monthly premiums and tax reduction for employer-sponsored health insurance, should be encouraged in order to shield Malaysians from financial hardship.

PP3.27 Publicly funded oral healthcare services utilisation among Malaysian adults: findings from national surveys

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Malaysian healthcare system encompasses both public tax-funded, government services and a thriving private sector. The aim of this study is twofold: (1) to explore the trends in prevalence and public-private composition for outpatient oral healthcare utilisation among Malaysian adults, and 2) to examine the determinants of publicly funded oral healthcare services utilisation. Data of Malaysian adults aged ≥ 18 were analysed using STATA 14 and sampling weights was applied. For trends, data from three national surveys (2011, 2015, and 2019) were analysed. For determinants, Andersen's Behavioural Model was used as a framework, and multivariable logistic regression was conducted on 2019 data. The dependent variable was any utilisation of publicly funded oral healthcare services in the last 12 months. The prevalence of outpatient oral healthcare utilisation among Malaysian adults was observed to have decreased from 17.1% (95% CI:14.9-19.6) in 2011 to 13.9% (95% CI:12.7-15.1) in 2019. However, publicly funded services utilisation had increased dramatically from 42.1% in 2011 to 60.3% in 2019. The determinants of publicly funded oral healthcare services utilisation were age, ethnicity, education level, employment status, locality, socioeconomic level, and health status. Those with lower socioeconomic status and the rural population were more likely to use the public sector. The public sector serves as a safety net, providing basic oral healthcare services at minimal or no cost to ensure accessibility for vulnerable populations. While the public sector primarily delivered oral healthcare services, avenues for public-private partnership should be explored further to leverage private sector resources, which may ease the load on the public sector.

PP3.28 Role of project team and management in sustaining lean healthcare: a scoping review

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Lean has been implemented for more than 2 decades in healthcare services, but sustaining lean is still an issue. Whether or not lean is sustained in healthcare facilities, little is known since lack of study on the sustainability of lean and the success factors influencing lean sustainability. Hence, this presentation will highlight on the role of project team and management as part of the success factors in sustaining lean. A scoping review was conducted to identify the success factors influencing sustainability of lean healthcare. The searches were formulated using the PIO (Population, Intervention and Outcome) framework. The databases used were Emerald Insight, Ovid Medline, Pubmed and Google Scholar as the search engines with backward citation searching. Thematic analysis was used to analyse the retrieved articles. This research highlights eleven main themes from forty articles found that were related to success factors that influencing lean sustainability. This presentation emphasizes on the significance of project team and management aspect as a success factor for sustaining lean. Project team has five sub-themes identified; lean adoption, define role, engaging lean expert, stakeholder engagement and team establishment. While project management has eight sub-themes identified: planning, lean tool, visual management, comprehensive approach, voice of customer, staff engagement, continuous improvement, and communication. Findings shows that comprehensive approach with involvement from all levels of staff as well as engaging expert, stakeholder and patient with proper planning for improvement using right tools were important in the sustaining lean.

PP3.29 Unveiling the unexpressed: a content analysis of patient safety concerns among medical laboratory technologists in blood bank laboratories

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Medical Laboratory Technologists (MLTs) should practice good patient safety culture, even though they indirectly interact with patients. Thus, identifying other unexpressed complaints and problems may reveal what MLTs face in their workplace and how they can affect patient safety. The aim was to identify issues of patient safety and working in blood transfusion laboratories by MLTs. This is a content analysis of an open comment box in the online survey evaluating the patient safety culture of MLTs working in blood bank laboratories in MOH hospitals. The data was collected from October until November 2020. A survey link was distributed to all MLTs involved in blood bank service in their daily work and on-calls. MLTs who worked in the National Blood Centre and were only involved in the blood bank mobile team were excluded. At the end of the survey, an open comment box enables respondents to comment about patient safety or error reporting in their hospital. Themes and subthemes were constructed from the comments. In total, 41 comments were suitable to be analysed. These are among the themes: "Roles and responsibilities of supervisors and upper management", "Staffing shortages", "Standard Operating Procedure violations" and "Blame culture". Open comment boxes in surveys often serve as a platform for unvoiced needs. The findings revealed problems faced by MLTs working in blood bank laboratories which may affect patient safety. The organization should take these findings for further discussion and implement corrective actions to further improve the safety and quality of blood transfusion services.



PP3.30 Teachability of health policy and systems research competencies set: stakeholders' perspective

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The Health Policy and Systems Research (HPSR) competency set serves as a valuable reference for teaching and practising high-quality HPSR. This abstract aims to evaluate the teachability of this competency set from the perspective of HPSR stakeholders in Malaysia. A mixed method approach consisting of online survey and in-depth interviews (IDI) were done. Online survey was conducted from April to June 2021 using questionnaire involving 44 participants from previous HPSR workshops, looking at the relevance and teachability of the seven domains of HPSR competency set. The questionnaire used a 5-point Likert scale, which was grouped into three categories (disagree, neither agree or disagree, and agree). Subsequently, 16 in-depth interviews were done with relevant HPSR stakeholders to explore how easy it would be to teach these competencies to others. Out of the seven domains, Domain 3 (Critically appraise data and evidence related to health systems) shows the highest result for teachability (47.7%), followed by Domain 4 (Ethical reasoning and practice, 34.1%). On the other hand, the domain with lowest result (20.45%) for teachability was Domain 5 (Lead and mentor). These findings were also supported by statements from the IDI in which respondents mentioned Domains 3 and 4 are incorporated into HPSR training syllabus, whereas Domain 5 is nurtured through experience. With the HPSR competency set as a guidance, HPSR trainers and educators can design effective HPSR training, supporting learners in producing robust evidence, engaging in the research cycle, and enhancing health systems.

PP3.32 Translating evidence into policy: perspectives from Malaysian health system actors

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Translating research evidence into policy is vital for every health system, yet it poses significant challenges. This abstract focuses on the challenges of evidence-to-policy translation in the Malaysian health system. Sixteen key informant interviews were conducted virtually from April to May 2021 with researchers, academicians, policymakers, healthcare practitioners, and non-governmental organisation members. Interviews were conducted using a semi-structured interview guide, recorded, transcribed and thematic analysis was performed with nVivo11. This study identified three key challenges in translating research findings into policy. First, there was a lack of effective communication channels, hindering the dissemination and utilisation of research evidence. Translating evidence into policy requires sustained engagement with policymakers, especially influential decision-makers such as politicians, to ensure the incorporation of findings into policy discussions. Second, policymakers often focus on strategic implementation rather than interpreting evidence-based findings. Policymakers and researchers experienced a disconnect in policy development and evaluation, which should ideally be collaborative. This disconnects created discomfort and misunderstanding between researchers and policymakers, hindering effective evidence-to-policy translation. Third, the lack of mechanisms that facilitate evidence-informed decision-making further compounded these challenges. Engaging all relevant stakeholders involved in translating a policy issue at different time points of the research is crucial. By doing so, research objectives can align with policy needs, enhancing the relevance and applicability of research findings. Addressing these challenges requires a multifaceted approach. Strengthening communication channels and methods, enhancing researchers' capacity to engage with policymakers, fostering collaboration between research and policy communities, and promoting early stakeholder involvement can bridge the gap.

PP3.33 Users' Voice: Hospital Information System (HIS) implementation and data quality

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The implementation of Hospital Information Systems (HIS) in selected hospitals by the Ministry of Health (MoH) Malaysia aimed to enhance healthcare data management. However, concerns have arisen regarding the adoption and utilisation of HIS, specifically concerning data quality. This study investigates the implementation issues that affect data quality and potential solutions proposed by the HIS users. A qualitative approach was employed, involving 12 focus group discussions (FGDs) and 18 in-depth interviews (IDIs) conducted among HIS managers and users in six HIS hospitals in April 2019. Audio recordings were transcribed verbatim and thematically analysed using the systems thinking approach. The interviews revealed several implementation issues that influence data quality, categorised into themes such as infrastructure, system configuration, user factors, and vendor performance. Infrastructure issues, including insufficient workable laptops, outdated hardware, and network connectivity problems were identified to have hindered effective HIS utilisation and require comprehensive rectification. Users also proposed system configuration improvements, such as enabling process verification and error correction, as well as enhancing interoperability among multiple information systems. Adequate training to enhance user competency and improve communication among healthcare providers emerged as crucial for optimising HIS utilisation. Furthermore, ensuring vendor support continuity for maintenance was highlighted. Data quality issues at the operational level stem from various underlying factors, some of which can be promptly addressed, while others require more extensive measures. The solutions proposed by end users offer valuable insights that can guide policymakers in improving HIS implementation and data quality in MOH's hospitals.

PP3.34 Validity and reliability of the Malay version of the perception of smoking (MPS) among secondary school-going adolescents

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Perception of smoking is one of the central factors influencing smoking among adolescents, hence the availability of a proper tool for measuring perception is much needed in anti-smoking research. The study aims to establish the validity and reliability of the Malay language version of the Perception of Smoking instrument (MPS) for assessing perception of smoking among secondary school-going adolescents in Malaysia. We administered the MPS to 669 secondary school students selected through multistage sampling. Approximately 60% of the sample were male (n=398) students, and 69.9% (n=463) or more than two-thirds came from rural areas. The respondents were between 13-16 years old (age 13, 36.4% (n=241), age 14, 40.0% (n=265), and age 16, 23.6% (n=156)). Explanatory and confirmatory factor analyses (EFA and CFA) and Cronbach's alpha were used to evaluate construct validity and reliability of the MPS. Explanatory Factor Analysis and parallel analysis identified two domains in the MPS that accounted for 58.4% of the observed variance and confirmed by CFA. The two domains' internal consistency scores, which ranged from 0.734 to 0.867, suggested adequate reliability. The MPS has good psychometric qualities and is valid for assessing smoking perception intention among Malaysian secondary school-aged youth. Nonetheless, it needs to be studied further to determine its validity and usefulness across teenagers with diverse sociodemographic backgrounds.



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