

MALAYSIAN JOURNAL OF

**PUBLIC HEALTH
MEDICINE**

e-ISSN: 2590-3829

ISSN: 1675-0306

Volume 21 (Supplement 2) 2021

Official Publication of the

MALAYSIAN PUBLIC HEALTH PHYSICIANS' ASSOCIATION





MJPHM

Official Journal of Malaysian Public Health Physicians' Association

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International Centre for Casemix and Clinical Coding (ITCC)
Universiti Kebangsaan Malaysia Medical Centre (UKMMC)
Jalan Yaacob Latif, 56000 Cheras, Kuala Lumpur
Malaysia

ISSN:1675-0306

The Malaysian Journal of Public Health Medicine is published twice a year

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Malaysian Public Health Physicians' Association

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International Centre for Casemix and Clinical Coding
Universiti Kebangsaan Malaysia Medical Centre (UKMMC)
Jalan Yaacob Latif, 56000 Cheras, Kuala Lumpur
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KEYNOTE ADDRESS

Sustainable Health Financing for Pharmaceuticals Towards Universal Health Coverage

*Datuk Dr. Hishamshah Mohd Ibrahim
Deputy Director General of Health (Research and Technical Support)
Ministry of Health Malaysia*

Malaysia as an upper-middle income country is said to perform relatively well in terms of access to essential medicines. Nevertheless, like most countries, we are facing increasing pressure to provide affordable access to expensive new medicines and health technologies. In order to achieve Universal Health Coverage (UHC), and as part of target 3.8 of the Sustainable Development Goals by United Nations, it is crucial to ensure everyone have an access to safe, effective and quality and affordable medicines. According to Malaysia National Health Accounts Report, in 2019, Malaysia spent a total of RM 64.3 billion on health which is about 4.26% of the country's GDP. Ministry of Health at the forefront of public healthcare system spent nearly RM 28.8 billion and around 10% of the expenditure were on pharmaceuticals. Furthermore, based on data from the Pharmaceutical Services Program MOH, an estimated RM 4.5 billion were spent on pharmaceuticals in the private sector which is mainly financed through Out-of-Pocket and private health insurance. Total Expenditure on health and pharmaceuticals is expected to rise in 2020 & 2021 as Malaysia battles the Covid-19 pandemic and races towards vaccinating its population. In ensuring public funds for pharmaceuticals are used effectively and efficiently, MOH has established key policies to manage pharmaceutical spending in the areas of selection, procurement, distribution and use.

PLENARIES

PLENARY I

Sustainable Financing of Pharmaceuticals in Managing Covid-19 Pandemic: Is There More to Be Done?

*Professor Dato' Dr Syed Mohamed Aljunid
Chair, Department of Health Policy and Management
Faculty of Public Health
Kuwait University*

Covid-19 Pandemic that was officially declared by WHO on 11th March 2020 currently affected more than 220 million people globally with more than 4.6 million deaths. This mega pandemic of the century that affect almost all countries in the world has led to global recession reducing at least 10% of global GDP with the value of more than USD 9 trillion. To date Malaysian economy has contracted by 5.6% with the GDP value loses of more than RM 100 billion. In 2020, at least RM 305 billion has been spend by the government of Malaysia in the form of stimulation package. The financial needs for management of Covid-19 pandemic are to cover at least four main items: supply and vaccines, service delivery, surveillance system and enforcement of related regulations and policies. Two of the 16 health system responses to Covid-19 pandemic recommended by WHO are directly related to health financing. First is to mobilise financial support in order to ease logistical and operational barriers. Second is targeted towards individuals to mitigate potential financial barriers to accessing essential care. Many of the remaining recommendations also have the financial components such as mobilise additional workforce, organise health services close to home and ensuring regular stock of essential medicines and health technologies. In most countries, the main source of health financing for management of Covid-19 pandemic will be from domestic revenue through payroll tax or social health insurance. For vaccination programmes, external funding through Covax facilities might provide some support to low - and middle-income countries. Low interest loans from World Bank and Asian Development Bank might offer limited support to some countries but may not be desirable in long-term. Alternative financing arrangements such as through trust fund and social impact fund are most probably not able to provide sustainable solutions to health financing needs of most developing countries. In conclusion, most countries in the world are facing huge challenges in mobilising adequate fund to manage Covid-19 pandemic. Public funding mechanism through taxation and social health insurance are more likely to provide sustainable solutions to meet the financial gap in management of Covid-19 pandemic.

Keywords: Health Financing, Covid-19, vaccinations, taxation, Social Health Insurance

PLENARY II

Bridging Research to Policy Decision

Professor Dr Maznah Dahlui
Department of Social and Preventive Medicine,
Faculty of Medicine,
University of Malaya

Health research not only aims to fill in the gap in knowledge gap of health issues pertaining to the source, distribution, implications, and what health interventions are appropriate to be applied in the targeted community but more importantly is to translate the research findings so that it can be used to derive health policy which would enable the implementation of sustainable intervention for the benefits of the people. The gap between research and policy or research and health actions is still very wide, especially in low and middle-income countries (LMIC). Gap between research and policy continue to exist if the decision makers fail to consider high-quality research evidence when developing policy. Researchers have devoted much time and energy to talking about bridging the gap between research and decision making, yet significant gaps still exist between the two. To integrate research findings into the policy making process and to communicate research findings to policymakers can be very challenging for the researchers. Getting Research into Policy Practice (GRIPP) illustrates on the strategies to integrate research findings into the policy making process and to communicate research findings to policymakers. The author shares several local studies that have been conducted according to the GRIPP strategies which had successfully engaged the policy makers via the three recommended approaches. The concept of public engagement with health research requires a public that is both informed and active which requires the need to strengthen institutions and mechanisms that can more systematically promote interactions between researchers, policymakers and other stakeholders who can influence the uptake of research findings.

PLENARY III

Value Based Medicines Towards Sustainability in Pharmaceutical Financing

Dr. Kiu Siang Tay-Teo
Technical Officer,
World Health Organization Headquarters'
Department of Health Products Policy and Standards

In recent years, there have been increasing use of value assessment through Health Technology Assessment (HTA) in countries to inform the pricing of pharmaceutical products. If done robustly, the systematic approach of HTA could guide more informed decision making. However, commentators have noted many challenges and problems regarding the use of value-based pricing and HTA, particularly in lower income countries. Given the global trend in using value assessment through HTA to inform pharmaceutical pricing, it is important to discuss whether this approach could be one of the right tools among a suite of policy instruments to bring about more affordable access to medicines and health products, particularly in lower income countries, in line with broad public health objectives. This session will examine what 'value' and value-based pricing in medicines are, and how value-based medicines might contribute towards sustainability in pharmaceutical financing.

PLENARY IV

Journey Towards Medicine of Fair Pricing or Affordable Price of Medicine

Prof. Fatima Suleman

Professor/Director

World Health Organization Collaborating Centre for Pharmaceutical Policy and Evidenced Based Practice,

Discipline of Pharmaceutical Sciences,

University of KwaZulu-Natal

Medicines are critical to the success of health care systems. Increasingly high prices of medicines are impeding access and resulting in financial strain for governments, payers and patients alike. Governments and policymakers try to achieve the best possible price, while trying to incentive innovation and increase competition. This is a delicate balancing act with limited finances and a set of resources in order to maximize health outcome for patients. Increasingly governments are stating that medicines especially newly launched medicines are unaffordable. In many low and middle-income countries, as many as 90% of people purchase medicines through out-of-pocket payments, and thus medicines are the largest family expense item after food. Affordability could be defined as a situation in which we consider something (for example, a medicine) to be too expensive for someone. Another viewpoint could be that a person should at least be able to fulfill other basic needs after having purchased the medicine. However, to date, there is no easy and quick method of assessing affordability. It is also important to note that affordability will differ from health system to health system, and from country to country. This presentation will look at the journey towards affordable medicine pricing and more recently the concept of fair pricing, based on the presenter's own work and collaborative activities in the pharmaceutical pricing area. The following are areas that will be discussed: (1) overview of pricing concerns globally; (2) the South African case study; (3) global developments in improving access to affordable methods; and (4) current issues in the pricing debate. It considers the statements by different stakeholders towards a model for fair pricing. It ends with some questions to consider for research in this area in the future.

EDUCATIONAL SYMPOSIUM

Educational Symposium 1: ‘Sustainable Health Financing for Pharmaceuticals Towards Universal Health Coverage: Experience in Different Countries’

Sustainable Health Financing for Pharmaceutical Towards Universal Health Coverage: Experience in Taiwan

Dr Jasmine Pwu
Director
Taiwan National Hepatitis C Program Office
Ministry of Health and Welfare
Taiwan

Universal Health Coverage is the goal for all the governments and health care workers worldwide. Financing, as well as expenditure management, are the key aspects that need to be well planned to make a sustainable UHC healthcare system. Therefore, to build up a sustainable health financing is to support health systems to achieve universal health coverage by reducing health inequities and preventing financial hardships for the people. The management of pharmaceutical expenditure in healthcare is getting more and more difficult in recent years. The main reasons may be the demand rise along with better economic status in individuals, and the waves of potential highly effective medicines with high price tag entering the market. Taiwan national health insurance (NHI), aimed to provide quality care to all, is facing the same challenge of maintaining sustainable health financing for pharmaceutical. Several approaches are considered and some of them are implemented. In grand level, “global budget payment system” has secured the total spending in a specified year. The National Health Insurance Administration monitors the pharmaceutical spending to be around 25% of the total expenditure. Another approach, ‘Drug Expenditure Target’ is currently pilot-run to further ensure not over-spending in this sector. Dedicated fund for special program, such as DAAs treatment for chronic hepatitis C, is also a new way of financing. NHIA is now trying to implement a ‘horizon scanning database’ to collect the budget impact information of the potential drugs to file in listing application, to support the new drug financing. The financial risk should also be managed in listing/reimbursement decisions of new drugs. Health technology assessment system has been providing a framework to ensure the value of new drug exists before its inclusion to the formulary. Furthermore, some risk management tools, such as price-volume agreement and management entry agreement, etc., has been used.

Sustainable Health Financing for Pharmaceuticals Towards Universal Health Coverage: Malaysia's Experience

Mr Dinash Aravind
Senior Principal Assistant Director
National Health Financing Section,
Planning Division,
Ministry of Health Malaysia

Health has been an integral part of Malaysia government policies in ensuring that all Malaysians enjoy a relatively high overall standard of health services. Malaysia was reported to have achieved UHC in 1980's which has been attributed to the government's targeted expansion of rural primary care and effective intervention programmes in high priority areas since independence, in particular maternal and child health through a public primary care delivery network. Until today, healthcare and health remain an important agenda of Malaysia. In the 2017 Global Monitoring Report on Tracking UHC by WHO, Malaysia scored 70 out of 100 on UHC essential service coverage index with low risk of financial hardship. As in all health systems globally, pharmaceuticals play a crucial role towards health interventions and healthcare provision in Malaysia. Malaysia has performed relatively well in terms of access to essential medicines by its population by provision through its public healthcare network. Nevertheless, despite high coverage of essential services and medicines, in further strengthening UHC, Malaysia faces various health issues and challenges such as ageing population, increasing double disease burden, increasing health care cost and high demand for quality services. In view of the changing health needs and expectations of the population, transformation into a more sustainable health system is imminent as Malaysia move towards becoming a high-income nation. As transformation of the health system requires time, evidence based immediate and quickly implementable strategies and policies are essential to strengthen the health system. Furthermore, current expenditures must be carefully managed to cover population with quality health services, medicines which are safe, efficacious and of quality and strengthen financial protection against the potential impoverishing effects of paying out of pocket for essential health services and medicines.

Educational Symposium 2: ‘Strengthening Pharmaceutical Access Through Public Private Collaboration: Current and Future’

Strengthening pharmaceutical access through public-private collaboration: Current and Future

Professor Kenneth Lee
Professor of Pharmacy
Monash University Malaysia

Globally, institutions of higher education are going through a difficult time brought about by intense financial pressures leading to fundamental challenges to the operation and long-term sustainability. Despite these, staff are expected to do more – to improve student outcomes, provide more and better options for student, to compete in an increasingly online and global marketplace, and last but not least an ever rising demand for higher global ranking. Given this background, today’s universities are more open to partnering with the private/industry sector compared to what it was decades ago. This trend in public-private partnerships (3Ps) has recently become more important especially on the academic side of a university. Academic partnerships involve a private sector partner in providing a range of services, capital, and expertise, sharing both risks and rewards over a long-term contract with an institution. The outcomes on the university side can include developing online programs, recruiting international students, supporting student further education, and improvement in research ranking of the institution. On the industry side, 3Ps can bring along reputation, and increased revenue due to improved sales of products. As university relationships with private companies evolve and expand, success depends on an institution’s ability to manage the partnership effectively. If executed correctly, these partnerships will potentially lead to an all-win situation for the university, industry and society as a whole. This lecture covers the background, fundamental concepts, risks and stories of success of 3Ps in Malaysia.

Strengthening pharmaceutical access through public-private collaboration: Current and Future

Mr. Chin Keat Chyuan
President of PhAMA (Pharmaceutical Association of Malaysia)

This session covers the strengthening of pharmaceutical access through public private partnerships (PPPs). It first briefly introduces PhAMA and how PhAMA member companies have been a key contributor to the pharmaceutical industry through its health, economic and social contributions. It will then provide some history and background on PPP efforts in Malaysia throughout the years and touch on recent positive developments in Malaysia in regard to PPP initiatives. For example, how certain ministries have started to adopt PPP models and introduced various PPP related projects and initiatives. Several PPP related programs have been implemented under the Ministry of Health through the UKAS initiative. The session also provides some context on the importance of having these PPPs and forming strategic partnerships to address the country's top healthcare issues (e.g., an aging population and a high prevalence of non-communicable diseases). It will then proceed to provide a correlation between PPPs and the country's need to increase healthcare spending that is also exacerbating the accessibility gaps to advanced treatments and medicines. "Proposed PPP as a solution to address rising healthcare needs and fiscal constraints."—To provide a better illustration on how to explore PPPs in an inclusive and planned manner, several solutions are also introduced in this session. The solutions introduced include the industry's call for a more productive dialogue with relevant authorities to increase PPP projects through collaboration with pharmaceutical companies. With a strengthened cross-sector collaboration, the industry can better support the Malaysian government to provide quality healthcare to its citizens in a sustainable manner. The presentation will also look at some case examples where PPPs have been successful and how Malaysia could emulate them (e.g. Singapore and the Netherlands).

Strengthening pharmaceutical access through public-private collaboration: Current and Future

Dato' Dr Faridah Aryani Md Yusof
Former Senior Director of Pharmaceutical Services
Ministry of Health Malaysia

Public Healthcare services and private healthcare services are separated and segmented. Limited resources such as funding, workforce and facilities in the public sector. The objectives are to achieve maximum benefit in healthcare from limited public capital, to achieve sustainable return on private investment and higher quality health services at sustainable, rational and affordable cost, specifically on pharmaceutical items. Overburden in government facilities and lack of integration between public and private services seemed to be the issues. Even though the policy has allowed public hospitals to decant and divert patients fast to private hospitals thus providing more spaces within the hospital to treat the more severe cases, the challenges in the implementation for the policy on outsourcing of services for both COVID-19 and non-COVID-19 cases do still exist. Stronger ties between public and private healthcare providers are crucial, and the statement on smart partnership and collaboration among stakeholders is clearly written under the 5th component in Malaysian National Medicine Policy. As part of the solutions, the current and planned future initiatives in strengthening pharmaceutical access in Malaysia by Pharmaceutical Services Programme, Ministry of Health are discussed. The initiatives include implementation of innovative pharmacy service delivery through expansion of integrated drug delivery system, and improve accessibility of pharmaceutical products through rationalisation of medicines pricing system in the public and private sector. Increasing access to pharmaceuticals such as new expensive medicines may need a well thought and thorough planning to obtain a positive impact on the healthcare system. Participation and collaboration with the private health providers, within the country and also among healthcare providers in ASEAN countries should be the way forward.

ORAL PRESENTATION

Health Systems and Policy Research.

OP1

A Systematic Review of Medical Costs of Tonsillectomy: How Much Does It Cost Across the Globe?

Amirah Azzeri^{1,2}, Mohd Hafiz Jaafar¹, Tengku Amatullah Madeehah T Mohd¹, Nadia Samsudin³, Fatin Diyana Abdul Aziz⁴, Tengku Shahrizal Tengku Dato' Omar⁵, Sajaratulnisah Othman^{6,7}, Fatiha Shabaruddin⁸, Tan Sien Hui⁵, Sakina Ghauth⁵, Mohamad Helmi Mohamad Yasim², Nurhasnira Abu Hassan², Muhammad Khairul Asraf Shah Nizamuddin^{2,3,4}, Ng Chiu Wan⁴, Thinni Nurul Rochmah⁷ Maznah Dahlui^{2,3,4,9}

¹ Public Health Unit, Department of Primary Care, Faculty Of Medicine And Health Sciences, Universiti Sains Islam Malaysia

² Department of Research, Development, and Innovation, University Malaya Medical Centre, Malaysia

³ Centre of Population Health, University of Malaya, Malaysia

⁴ Department of Social and Preventive Medicine, University of Malaya, Malaysia

⁵ Department of Otorhinolaryngology, University Malaya Medical Centre, Malaysia

⁶ Department of Primary Care (RUKA), , University Malaya Medical Centre, Malaysia

⁷ Faculty of Medicine, University of Malaya, Malaysia

⁸ Faculty of Pharmacy, University of Malaya, Malaysia

⁹ Faculty of Public Health, Universitas Airlangga, Indonesia

Tonsillectomy is one of the most common procedures in the otorhinolaryngology discipline, which is done on children and adults. The main indication for this procedure is chronic tonsillitis. The effectiveness of tonsillectomy is well known; however, the costs of this procedure are less compared between countries. The main objective of this study was to review the literature on the direct medical costs of tonsillectomy worldwide. A systematic search was conducted using the traditional search and citation forward and backward tracking with three databases, PubMed, Scopus, and Web of Science to identify relevant articles following the search term of ('cost effectiveness' OR 'cost analysis') AND 'tonsillectomy'. 556 articles were initially identified. After excluding 423 duplicates, 65 articles were screened through their titles and abstracts. 35 articles were included in the systematic review. 28/35 of the study described the costs from the provider's perspective and reported cost per treatment episode with/without follow-ups. The costs of treatment episodes include the cost of overhead, hospitalisation, drugs and investigations. The remaining study included costs related to the tonsillectomy procedures only such as personnel, consumables and clinical equipment. 23/35 studies used a top-down costing approach to calculate the costs. All costs were inflated and adjusted to USD\$,2021[1USD=4.42MYR]. The average cost of tonsillectomy procedure was \$1884 and range from \$1052 to \$2653. There was a huge range of costs for a treatment episode (\$2202 to \$5590) due to the differences in the length of stay. Paediatrics cases were reported to have 8 to 9 days of admission in contrast to adult cases that only required 2 to 3 days of hospitalisations. In conclusion, the costs of tonsillectomy are varying across countries due to the differences in the clinical guidelines and hospital policies. Clinicians should be aware of the financial implications for unnecessary hospitalisation for pre and post procedures.

Keywords: Tonsillectomy, Direct Medical Costs and Chronic tonsillitis

OP2

Satisfaction of Patients, Staff and Visitors with the Interior Design Quality of Inpatient Units in Malaysian Public Hospitals

Shariffah Syafiqah Aljunid, Mohd Zafrullah Mohd Taib, Zanariah Abu Samah

Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Malaysia

The physical environment of healthcare facilities has significant impacts on the health and wellbeing of the users. A hospital building is designed and built primarily to meet the needs and desires of its users, especially those of the inpatient units, which takes up the majority of the hospital area and are where patients spend the most time to recover. This research aims to determine the users' satisfaction level towards the interior design quality of the inpatient units in Malaysian public hospitals. A total of 1,373 respondents comprised of 473 patients, 399 staff and 501 visitors from 17 inpatient units of Obstetrics and Gynaecology specialist department in 5 public hospitals participated in the 48-items (5-point Likert scale) questionnaire surveys to measure the users' satisfaction level focusing on the space planning, privacy, materials and finishes, and air quality. Then, as a follow up to the questionnaire survey, the current physical condition of the inpatient units was assessed as case studies by conducting semi-structured interviews with 29 patients, 27 staff and 17 visitors and on-site observations. The findings from the questionnaire survey revealed patients were the most satisfied group (mean score=3.82) on overall interior design quality, followed by visitors (mean score=3.73) and staff (mean score=3.61). The case study findings provided evidence that described the inpatient units' existing physical condition as satisfactory, validating the grounds for the questionnaire survey results. In summary, this research represents an attempt to support the importance of the physical environment in fostering hospital users' satisfaction. It demonstrates significant progress in understanding the current situation of the country's healthcare facilities, especially in the light of quality in interior design, while providing information that will hopefully inspire professionals to design better inpatient units in the future.

Keywords: User satisfaction, Interior design, Quality, Inpatient and Public hospital

OP3

Job Satisfaction Among Dentists Working in Primary Health Care Centers in Kuwait.

Rudainah Aloufan and Syed Mohamed Aljunid

Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait.

A potential obstacle to the improvement of dental health in State of Kuwait is the job satisfaction of dentists working in Primary Health Care Centers (PHCCs) that provide dental care to a large percentage of Kuwait's population. Previous research has linked high job satisfaction among health care providers to better organizational outcomes. This is a cross-sectional study that aims to examine the level of job satisfaction among dentists working in the PHCCs in Kuwait. 400 dentists working in the PHCCs in Kuwait were recruited using random sampling technique. Participants completed a self-administered questionnaire, adopted from the "Dentist Satisfaction Survey" and the "10-item Warr-Cook-Wall job satisfaction scale". The response rate was 85.0% (n=340). Most of the respondents were females (57.9%), Kuwaiti (85.0%), younger than 40 years (88.0%) and served as dentist less than 10 years (75.9%). Overall, 52.4% of the respondents were satisfied with their jobs. The highest satisfaction was related to job security, skills at dealing with patients, and work relationships. Respondents were least satisfied with physical demand of the job, recognition, and evaluation of work performance. Bivariate analysis indicated that non-Kuwaiti dentists were more job satisfied than the Kuwaitis (71.0 % vs 49.1% satisfied; $p=0.005$). Dentists aged 40 years and above were the most satisfied group (85.7%) followed by those with 10 or more years of work experience as dentist (68.3%). Dentists ranked as senior registrar and specialist were more satisfied (65.0%) compared to the general practitioners (62.0%) and the registrars (36%). Multiple logistic regression analysis revealed that four subscales of independent variables had significant relationship with the overall job satisfaction score; which were age, educational level, marital status and job rank. The overall job satisfaction level among dentists working in PHCCs in Kuwait was moderate. Measures to enhance job satisfaction level include implementation of ergonomic awareness training program, improvement of recognition and performance appraisal mechanisms, and job redesign and enrichment. These measures could potentially yield higher job satisfaction level among dentists working in PHCCs in Kuwait.

Keywords: Job satisfaction, Dentists, Primary Health Care Centers and Kuwait.

OP4

Estimating the provider's cost for inpatient and outpatient services at teaching hospitals in Malaysia

Ahmed Abdelmajed Alkhodary ^{1,4}, Syed Mohamed Aljunid ^{1,2}, Aniza Ismail ³, Amrizal Muhamad Nur ²

¹ International Centre for Casemix and Clinical Coding, Faculty of Medicine, National University of Malaysia

² Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait

³ Department of Community Health, Faculty of Medicine, National University of Malaysia

⁴ Ministry Of Health, Gaza Governorates, Palestine

Worldwide, health expenditure continues to rise. This rise is due to the escalated community healthcare needs. Large portion of these expenditures are due to hospital-related services. Healthcare cost calculation is crucial, it allows for securing the necessary fund to continue these services. Additionally, healthcare costing aims to help decision-makers to develop effective and efficient healthcare services. Several approaches are used for healthcare costing worldwide. Non-patient specific approaches, such as step-down costing is commonly used. It is worth noting that the step-down costing approach is considered transparent, cheaper, faster, and more comprehensive. The aim of the study is to estimate the provider's perspective of cost for outpatient visit and inpatient day at two teaching hospitals (TH₁ and TH₂) in Malaysia using step-down costing approach. The study included both TH₁ with a hospital capacity of 873 beds and TH₂ with a hospital capacity of 1,054 beds in Malaysia. These hospitals were established in 1984 and 1997, respectively. Data was collected using the MY-DRG costing templates developed by the International Centre for Casemix and Clinical coding at the National University of Malaysia. The average cost per visit at the medical clinics was RM285 and RM225 for TH₁ and TH₂, respectively. The average cost per visit at the surgical clinics was RM343 and RM220 for TH₁ and TH₂, respectively. The average cost per inpatient day at the medical ward was RM539 and RM1,342 TH₁ and TH₂, respectively. The average cost per inpatient day at the surgical ward was RM1,464 and RM2093 TH₁ and TH₂, respectively. In conclusion, the outpatient cost per visit at the teaching hospitals in Malaysia is between RM220 and RM343, while the inpatient cost per day cost is between RM539 and RM2093. Increasing the healthcare services efficiency and reducing cost variations would be of tremendous effect on reducing countries' total expenditures.

Keywords: Hospital, Healthcare cost, Inpatient, Outpatient, Step-down costing and Malaysia

OP5

Provider Costs of Treating Mild Cognitive Impairment Among the Elderly in Public Hospitals of Malaysia

Amrizal Muhammad Nur^{1,2}, *Syed Mohamed Aljunid*^{1,2}, *Normaz Wana Ismail*^{3,4}, *Sharifah Azizah Haron*^{4,5}, *Asrul Akmal Shafie*⁶, *Norashidah Mohamed Nor*^{3,4}, *Mohmad Salleh*⁷, *Roshanim Koris*^{4,8}, *Nimetcan Mehmet*⁹, *Tengku Aizan Hamid*⁴

¹ International Centre for Casemix and Clinical Coding, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre Bandar Tun Razak 56000 Cheras, Kuala Lumpur, Malaysia

² Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait

³ School of Business and Economics, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

⁴ Malaysian Research Institute on Ageing (MyAgeing™), Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia

⁵ Department of Resource Management & Consumer Studies, Faculty of Human Ecology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

⁶ Discipline of Social & Administrative Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800, Penang, Malaysia

⁷ Family Health Development Division, Ministry of Health, Malaysia, Level 7, Block E10, Complex E, Presinct 1, 62590, Putra Jaya, Malaysia.

⁸ Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia

⁹ Public Health Department, Faculty of Medicine, Ankara Yildirim Beyazit University, Ankara Turkey

As greater numbers of the elderly use health care services, and as health care costs increase, effective economic cost estimation for specific age-related diseases like mild cognitive impairment (MCI) is essential. The objective of this study is to estimate the costs of treating patient MCI in the hospital setting. Seven public hospitals were randomly selected across seven states in Malaysia between January 2010 and December 2014. Hospital costing data was obtained using a standardized costing template while patient clinical data were extracted from the medical records using a pre-tested questionnaire. A number of 128 patients were randomly selected from the selected hospitals. The cost analysis for the hospital setting was carried out using a step-down costing methodology. Study results showed that 49.2% of the patients were male and the average age was 71 (SD=7.01) years (range: 60-92 years). A total of 51.6% were Chinese, 22.7% Malay, 13.3% Indian, and 12.5% others. The mean cost of MCI cases per episode of care was RM 12,806 (SD=10,389) with the mean length of stay of 14.3 (SD=9.9) days. The top three cost components of the total cost for the treatment of MCI were ward services (62.78%), the pharmacy (10.25%), and the intensive care unit (7.64%). A multiple linear regressions analysis showed that factors that significantly influence the treatment cost of MCI cases were the length of stay ($p<0.001$), followed by the ward admission ($p<0.001$), age of the patient ($p=0.005$) and married ($p=0.045$). In conclusion, the ward services consumed most of the financial resources for the treatment of MCI. A cost quantification and distributive mapping of the burden of care of MCI can assist in the development of strong policy to prioritize effective interventions among the elderly.

Keywords: MCI, Provider Cost, Step-down costing and In-patient

OP6

Compliance of Administrative Procedures Among Managers in Military Hospitals in Malaysia

Junaidah Binti Kamaruddin¹, S A Zafirah, and Syed Mohamed Aljunid³

¹ National Defence University of Malaysia

² Casemix Solutions Sdn Bhd

³ Department of Health Policy and Management, Faculty of Public Health, Kuwait University

Excellent service is one of the outcomes desired by every healthcare organization. Manager's compliance with administrative procedures is one of the crucial factors of the excellent services rendered. Therefore, this study aims to explore the compliance of administrative procedures among managers in Military Hospitals in Malaysia. This cross-sectional study was conducted across five Military Hospitals in Malaysia. A total of 520 self-administered 5 Likert-scale questionnaires were distributed to military and non-military managers with different demographic backgrounds and services characteristics. The distributed questionnaire consists of 31 questions. The response rate was 96.4% (501/520). The mean score of compliance was 75.20 (SD: 9.88) with a minimum score of 55 and, a maximum score was 105. The univariate analysis shows that 97.4% (427/501) of the respondents agreed that the compliance of administrative procedures was low. The analysis using Structural Equation Modelling (SEM) confirmed that the manager's grade ($t=2.552$, $p=0.004$) and manager's scheme ($t=0.770$, $p=0.530$) influenced their compliance to the administrative procedures. The analysis using multiple logistic regression (MGR) further confirmed that managers in the grade 41 and below had a higher tendency to comply with the administrative procedure than managers in higher grades ($B=7.342$, $p<0.0001$). The MGR analysis also shows that managers from the non-military managers had a higher compliance rate compared to managers from the military scheme ($B=1.954$, $p=0.031$). The output from SEM also indicates that compliance of administrative procedures is significantly related to service excellence ($R^2=0.392$, $t=18.502$, $p<0.001$). Therefore, it is imperative to institute more programmes to increase awareness on compliance of administrative procedures among managers across military hospitals in Malaysia.

Keywords: Administrative Compliance, Excellent Service, Military Hospitals and Managers.

OP7

Value Based Pricing in Malaysia: A Stakeholder Analysis

Mohammad Amirul Ashraf¹, Ong Siew Chin¹

¹ Department of Pharmaceutical Sciences, Universiti Sains Malaysia

High pharmaceutical price is a dilemma. Value-based pricing (VBP) has touted to be the potential solution to this problem. However, in Malaysia, VBP does not receive favourable response from the industry players. Therefore, in this study we would like to examine the position of various stakeholders on this issue. Data was collected from peer-reviewed documents and grey literature (such as white paper, reports and working papers) from 2004 to 2021 through general web-based search. Social media such as Facebook and Youtube were also included. PolicyMaker tool is used to evaluate the position and interest of the various stakeholders. Next, we assess the factors that might contribute to the policy success or failure using Kingdon's multiple stream approach. We found that VBP received positive response from the stakeholders although some request for amendments. The problem was framed properly such that all the stakeholders understood the need for VBP. The policy was sufficiently explained with the publication of the guidelines. Continuous engagement between the government, especially the health technology assessment (HTA) division and the private sector plays a major role. Strong political will from both the government and the opposition also contributed to the success. Our findings showed that VBP implementation is successful due to proper problem framing, policy clarity, strategic engagement and strong support from the government and the private sectors.

Keywords: Value based pricing, pharmaceutical policy, Price regulation and Stakeholder analysis

OP8

Successes and Obstacles in Implementation of Social Health Insurance in Developing and Low- and Middle-Income Countries (LMICs): A Scoping Review of 5 year recent literatures

Mohammad Husni Jamal^{1 2}, *Aznida Firzah Abdul Aziz*³, *Azimatun Noor Aizuddin*^{4 5}, *Syed Mohamed Aljunid*^{5 6}

¹ University of Cyberjaya, Selangor, Malaysia

² Academy of Family Physicians of Malaysia.

³ Department of Family Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia,

⁴ Community Health Department, Faculty of Medicine, Universiti Kebangsaan Malaysia.

⁵ International Centre for Casemix and Clinical Coding, Universiti Kebangsaan Malaysia Medical Centre.

⁶ Department of Health Policy and Management, Faculty of Public Health, Kuwait University.

Social Health Insurance (SHI) as a form of health finance mechanism had been implemented in many countries with the aim of achieving Universal Health Care (UHC) for its population. In attempting to emulate the successes of SHI in many developed countries, many developing and Lower-and-Middle-Income countries (LMICs) are also attempting to follow suit. However, the implementation of SHI in these countries were not without problems and obstacles. The purpose of this scoping review is to study the various developments of SHI globally in its uses, implementation, successes and obstacles within the last 5 years from 2017 to 2021. Using 3 databases which are PubMed, Ebsco and Google Scholar, we reviewed all forms of articles on SHI including grey literature. The PRISMA-ScR protocol is adapted as the guideline. Articles included quantitative and qualitative studies, narratives, editorials, commentaries as well as non-peer reviewed grey articles such as working papers. About 51 articles were included in the final review. Results shows that the majority of SHI studies were in China and African countries. There were also recent experiences from other Asian countries but only a few in South America. The overall analysis reveals 10 common themes such as health finance mechanisms, coverage of the poor and willingness to pay. Successes included a comprehensive checklist for SHI implementation in Nigeria and the coverage of the poor in the Indian VAS scheme. Obstacles included the Hukou problem for internal migrants in China and the lack of willingness to pay in Sarawak. The conclusion was that the implementation of SHI to achieve UHC would need to consider several factors and issues such as coverage rate, funding capacity and its efficient management and policy consistencies. Eventually, full UHC would only be possible with a combination of general taxation and SHI.

Keywords: Social Health Insurance, National Health Insurance and Community Health Insurance

OP9

Development of Usability Guidelines for Designing Mobile Clinical Coding and Grouping Application for Mobile Health System

Shariffah Syazwana Aljunid, Nurhizam Safie Bin Mohd Satar, Rozilawati Binti Razali

Center for Software Technology and Management (SOFTAM), Faculty of Information, Science and Technology (FTSM), Universiti Kebangsaan Malaysia.

E-Health System is an electronic health system that provides health care services to the community and healthcare staff. The rapid progression of technology has led to web-based e-Health systems migrating to mobile device systems known as m-Health application. M-Health application provides users with more efficient and convenient services. Unfortunately, m-Health application has such restricted content display, content selections, and performance-influencing features. Past research gave guidelines on general e-Health and usability of m-Health systems that are not optimised for m-Health's interface. General guidelines are difficult to implement on applications that have specific domains and complex functionality such as m-Health application because it affects its usability. However, the absence of specific m-Health guidelines with the complex functionality of an application has also made it difficult to develop a quality and satisfactory interface if it follows the general guidelines. Hence, specific m-Health application usability guidelines for specific functionality with quality and sound research should be developed to ensure the best usability and quality for users. The aim of this study is to produce a m-Health usability guideline based on usability components that notably stress the functionality of clinical coding and grouping for healthcare staff that has never been developed in Malaysia. The guideline was produced by combining literature review and conducting interviews with experts in human-computer interaction (HCI) and usability. The theoretical and empirical outcomes have been analysed through content analysis method via NVivo software. The proposed usability guidelines were tested for accuracy and applicability by developing prototypes which then were evaluated by experts from the domains, user interface/user experience (UI/UX) and m-Health developers. Therefore, the usability components and its features can be precisely and suitably refined and adapted to the guidelines and prototype. The guidelines can be used by industry experts to create clinical coding and grouping m-Health application.

Keywords: Design, Guidelines, Usability, Mobile, Health, M-Health, Applications, App and Application.

OP10

Dementia: Understanding the Out-of-Pocket Healthcare Expenditures Among the Caregivers

Jaafar, Hafiz¹; T Mohd, Tengku Amatullah Madeehah¹; Mohd Razi, Nuurain Amirah¹; Abu Baharin, Fakhri; Azzeri, Amirah;

¹Public Health Unit, Department of Primary Health Care, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia

More than 60% of the elderly with dementia is expected to live in Malaysia by 2030. As their number increases, the number of people associated with the caregiving routine will also increase. Due to this routine, the caregivers had to incur extra medical expenditures on the elderly. To date, local data on the economic burden among informal caregivers of dementia patients is limited. Knowledge of the economic burden will facilitate policy-making in minimising the burden and incident of catastrophic healthcare expenditure experienced by the caregivers. A cross-sectional study was conducted at various public healthcare facilities in the Klang Valley with geriatrics clinics. The study was conducted among the informal caregivers of dementia patients. Data collection was done via face-to-face interviews using a validated questionnaire. Findings on the household expenditures were presented in Ringgit Malaysia [the price year 2020; 1USD=4.15MYR]. Several questions on the household expenditure incurred for the caregiving routine and requirement were obtained. These include out-of-pocket (OOP) expenditure for clinic and hospital charges, expenses on transportation for health visits, expenditure for daily necessities such as diapers and milk, expenditure on nursing care and also expenditure for home improvement assistance. Results showed that the average household expenditure incurred by the caregivers were approximately RM 3500 monthly. The highest OOP expenditure was reported for the nursing care services (RM 1675) followed by daily necessities (RM 920), medical charges at private facilities (RM 800) and other expenditures (RM 120). The other driver for household expenditure was for home improvement assistance, which was estimated at RM 6000. It is found that the informal caregivers of dementia patients experienced significant economic repercussions. Appropriate interventions targeted to caregivers to improve their economic burden in caregiving should be highlighted and planned thoroughly to prevent them from experiences financial health catastrophe.

Keywords: Healthcare expenditure, Dementia and Caregivers

ORAL PRESENTATION

Pharmacoeconomics

OP11

Characteristics and Outcome of Intensive Care Unit Outliers in A Malaysian Teaching Hospital

Yin Nwe Aung^{1,2}, Syed Mohamed Aljunid^{1,3}

¹ International Centre for Casemix and Clinical Coding, Faculty of Medicine, UKM Medical Centre, National University of Malaysia, Kuala Lumpur, Malaysia

² Department of pathology and community medicine, Faculty of Medicine and Health Sciences, UCSI University, Springhill Campus, Port Dickson, Negeri Sembilan, Malaysia.

³ Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait City, Kuwait

Cost of intensive care (ICU) are major contributing factors in escalating health care cost. Outliers in length of stay at ICU are usually not considered in estimating cost at ICU, or exploring the characteristics of the ICU patients. Knowing the characteristics of ICU outlier patients, would help in improving health services and cost containment. A cross-sectional study was conducted at four different ICUs of a teaching hospital in Malaysia from 2013 to 2015. The outliers were identified with their required length of stay (LOS) at the hospital ICU using L3H3 method. The cost at ICU was estimated using the step-down approach. During the study period, 221 (6.8% of 3,220 patients admitted to ICUs) were found to be outliers. The mean length of stay at ICU among short-stay outliers (L3) was 1.6 days whereas that of long-stay outliers (H3) was 22.7 days. The mean cost of care at ICU among H3 was RM 71,634, which is 5.2 times higher than the inliers and 12.6 times higher than L3 outliers. Among H3 outliers, the mean cost of care for General Intensive Care Unit (GICU) patients was RM 104,132 with 20 days of the mean LOS at ICU. Paediatric Intensive Care Unit (PICU) outlier patients required longer LOS at ICU with 32 days, but the mean cost is RM 53,275. In conclusion, H3 outlier ICU patients utilized 21% of the cost of care at ICU for ICU inliers although they were only 4.4% of the ICU inlier patients. On the other hand, L3 outliers utilizes only 1.1% of the inlier ICU cost regardless they were as high as 2.9% of the ICU inliers. The details of H3 outliers supports in identification of possible preventive strategies for these cases, and limits the ICU expenditure.

Keywords: ICU, Outliers, Costs, LOS and Malaysia.

OP12

Cost-effectiveness Analysis of Imatinib versus Nilotinib in the Treatment of Chronic Myeloid Leukaemia

Sharifa Ezat Wan Puteh¹, Ellyana Mohamad Selamat¹, Azimatun Noor Aizuddin¹, Nor Rafeah Tumian², Jameela Sathar³

¹ Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

² Department of Medicine, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

³ Department of Haematology, Hospital Ampang, Kuala Lumpur, Malaysia

Disease burden of chronic myeloid leukaemia (CML) is growing due to longer patient survival, better life expectancy of general population and increasing drug price. Funding issues are the main concern in the choice of medication used for CML worldwide, including Malaysia. This is a full economic evaluation research with retrospective cross-sectional study design intended to compare the cost-effectiveness between imatinib and nilotinib, in the treatment for CML patients, from care provider perspective. CML patients were recruited from outpatient haematological clinics, including the national centre of intervention and referral for haematological conditions. EuroQol EQ-5D-5L questionnaire was used to derive health-related quality of life, or utility scores. Costing data was obtained from Casemix MalaysianDRG Ministry of Health Malaysia. Imatinib and nilotinib drug costs were obtained from hospitals' administrative and pharmaceutical company. 221 respondents participated in this study, in which 68.8% were imatinib users. Quality-adjusted life years (QALY) were 17.87 and 20.91, per imatinib and nilotinib user, respectively. The cost for each CML patient taking imatinib for a year was RM 57,512.73, and RM 80,612.51 for nilotinib. Imatinib yielded the lowest cost per QALY at RM 3,218.40. Incremental cost-effectiveness ratio (ICER) nilotinib to imatinib in the treatment of CML patients was RM 7,598.61. Overall, nilotinib had higher drug price than imatinib, yet had better life expectancy, utility score and QALY. Nevertheless, imatinib was more cost-effective compared to nilotinib in the treatment of CML in Malaysia, from care provider's perspective. The value of ICER of nilotinib to imatinib suggests nilotinib to be cost-effective when compared to the value of Malaysia's Gross Domestic Product (GDP) per capita. Then again, it may be necessary to reduce the cost-effective threshold for healthcare expenditure in order to be more beneficial and realistic in this current pandemic era.

Keywords: Cost effectiveness, Imatinib, Nilotinib and and Chronic myeloid leukaemia.

OP13

Cost-effectiveness of Denosumab for the Treatment of Postmenopausal Osteoporosis in Malaysia

Yai Wen Choo^{1,2}, Mohd Shahrir Mohamed Said³, Mohd Makmor Bakry¹, Nurul Ain Mohd Tahir^{1}*

¹ Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

² Pharmacy Department, Kuala Lipis Hospital, Ministry of Health, Pahang, Malaysia

³ Department of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur, Malaysia

Previous economic evaluations suggested denosumab was cost-effective to treat postmenopausal osteoporosis. However, differences in epidemiology, healthcare system, and study population limit the generalizability of results to other countries. Hence, this study aimed to evaluate the cost-effectiveness of denosumab compared with alendronate or no treatment for postmenopausal osteoporosis in Malaysia. A well-validated Markov model was adapted to examine the cost-effectiveness of denosumab in a hypothetical cohort of postmenopausal osteoporotic women aged 50-80 years without a prior fracture. The analysis was conducted over a 10-year time horizon from the Malaysian healthcare provider perspective. Model parameters such as transition probabilities and costs were based on Malaysian sources. Treatment efficacy data were derived from a network meta-analysis. Results were presented as incremental cost-effectiveness ratios (ICERs) in cost per quality-adjusted life-year (QALY) gained. Denosumab was found to be more cost-effective than alendronate, with the ICERs ranging from MYR 11,790 (USD 2,846) per QALY at age 50 to MYR 1,605 (USD 387) per QALY at age 80. The cost-effectiveness improved with increasing age. At a cost-effectiveness threshold of MYR 21,438 (USD 5,175) per QALY, denosumab had a 93.7-98.2% probability of being cost-effective. Denosumab had a relatively higher probability (about 98%) at the starting ages above 60. Sensitivity analyses demonstrated that our results were robust within all parameter variations, and the most sensitive parameter was the annual cost of denosumab. From the perspective of the Malaysian healthcare provider, denosumab appears to be a cost-effective treatment option for postmenopausal osteoporotic women aged over 50 years. It is recommended to implement denosumab treatment starting from the age above 60 years.

Keywords: Cost-effectiveness, Denosumab and Postmenopausal Osteoporosis

OP14

Direct Medical Cost Savings from Switching of Partially Combined Vaccine “Pentaxim® and Hepatitis B” to Fully Combined Vaccine “Hexaxim®” in The Malaysian National Immunization Program

Lama Al Bashir^{1,5}, Syed Mohamed Aljunid^{1,2,3}, Aniza Binti Ismail^{3,5}, Azimatun Noor Aizuddin^{1,3,5}, S A Zafirah^{1,4}, Amrizal Muhammad Nur²

¹ International Centre for Casemix and Clinical Coding, Faculty of Medicine, UKM Medical Centre, National University of Malaysia, Kuala Lumpur, Malaysia

² Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait City, Kuwait

³ Malaysian Health Economic Association (MAHEA), Kuala Lumpur, Malaysia

⁴ Casemix Solutions Sdn. Bhd., International Centre for Casemix and Clinical Coding, UKM Medical Centre, Kuala Lumpur, Malaysia

⁵ Department of Community Health, Faculty of Medicine, University Kebangsaan Malaysia, Malaysia

Hexaxim® is a fully combined hexavalent vaccine that contains six antigens; Diphtheria, Tetanus, Pertussis, Hepatitis B, Poliomyelitis and Haemophilus influenza type b. Pentaxim® is a pentavalent vaccine that contains the same antigens as Hexaxim except for hepatitis B antigen, which is given as a separate vaccine. This study was primarily designed to examine the direct medical cost savings of switching from partially combined vaccine (Pentaxim® plus hepatitis B) to fully combined vaccine (Hexaxim®) in the Malaysian National Immunization Program (NIP). In this economic evaluation study, twenty-two primary healthcare centers were randomly selected across two states in Malaysia between December 2019 and July 2020. Direct medical cost of the vaccines was extracted using a costing questionnaire that included vaccine cost of; consumables, hazardous waste disposal, vaccine wastage and cold chain storage in addition to cost of vaccine. Vaccine administration time cost was imputed from time-motion study. The vaccine direct medical cost was calculated as cost per dose, cost per Fully Immunized Child (FIC) and cost per birth cohort (2019) and then the net cost savings were calculated for each type of vaccines. Study results shows that cost per dose of partially combined vaccine was RM 31.9 compared to RM 17.1 per dose of Hexaxim®, where the cost of vaccine administration time contributed to most of the cost (86.9% and 80.9% for partially and fully combined vaccine respectively). Cost per FIC for partially combined vaccine was RM 112.9 compared to RM 68.3 for Hexaxim®. Net cost savings per birth cohort was RM 21.8 million and RM 11.2 per dose if Hexaxim® was used in the NIP. In conclusion, incorporation of Hexaxim® within Malaysian NIP is highly recommended since the switch to this fully combined vaccine has led to substantial direct medical cost savings for healthcare providers.

Keywords: Economic impact, Hexaxim, Pentaxim and Malaysia National Immunization Program

OP15

Estimating the Magnitude of Out-Of-Pocket Expenditure On Family Planning: Evidence from Malaysia

Azzeri, Amirah, Jaafar. Hafiz, Mohamad Nor, Nadeeya 'Ayn, Abdullah, Amalia, Rosli, Asyiqin, Allani Huslan, Asyiqin; Yazid, Nadia, Rahim, Asyraf, Zainoodin, Munir, Saidin, Humaira, Zulkifli, Nur Hanisah, Muji, Nuraisya, Khair, Najmi, Ab Rahman, Amnan, Lukman, Saiful Syahmi, Basri, Taufeeq, S. Bahri, A. Hisham, Abol Kasim, Balqis Wan Izudin, Wan Athirah, Mohd Zin, Noorsuwaidah, Mohd Noor, Aidil, Rushdi, Firdaus, Azahari, Effa.

Public Health Unit, Department of Primary Health Care, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia

Family Planning (FP) services are available in public and private healthcare facilities in Malaysia. Several groups of people are eligible to receive free-of-charge services while some people are required to incur out-of-pocket (OOP) expenditure on FP. To date, local data on the magnitude of financial implications for FP is limited. This study was conducted to describe the monthly OOP expenditures incurred for FP and factors associated with the expenditure. A cross-sectional study was conducted among adults in Malaysia from April to June 2021 through an online survey. Information on sociodemographic profiles, socio-economic status, family planning utilisation and OOP expenditures on FP were collected. 473 people participated in the online survey, in which majority were female (83%), Malay (98%), Muslim (99%), Married (89%), has a university degree (58%) and employed (84%). The mean [SD] age of the study participants was 41.3 [10.38]. The median [IQR] monthly household income was RM7000 [6000]. 415 (88%) of them reported that the use of FP did not affect them financially while 358 (75%) believed that the FP is not expensive. 244 (52%) of the participants reported incurring a median [IQR] OOP expenditure of 100 [150] monthly for FP. Older age and higher household income were significantly associated with the higher OOP expenditure for FP (p-value <0.05). Gender, race, religion, academic background and employment status were not significantly associated with the OOP for FP. Analysis of catastrophic healthcare expenditure (CHE) revealed that only 12 (3%) of the households are spending more than 10% of their income with a range of 10-17%. Most of these households received treatment at private healthcare facilities and are using more than one contraceptive method. The majority of the participants reported that they did not incur any OOP expenditure and receives fully subsidized services. This study highlights that the FP services provided by the government are beneficial to improve family well-being and prevent unwanted pregnancies without burdening the people financially.

Keywords: Health economics, Family planning and Contraceptions.

ORAL PRESENTATION

Population based/ Epidemiological Research

OP16

Application of Machine Learning Techniques in Predicting an Individual Risk of Developing Non-Communicable Disease

Noor Afiza Mat Razali¹, Junaidah Kamarruddin², Syed Mohamed Aljunid³

¹ Defence Science and Technology Faculty, National Defence University of Malaysia

² Defence Studies and Management Faculty, National Defence University of Malaysia

³ Department of Health Policy and Management, Faculty of Public Health, Kuwait University

People are staying at home and doing less in terms of social interactions and exercises due to the COVID-19 pandemic. People also tend to overeat and this lifestyle behaviour increases the risk in developing non-communicable disease (NCD). Prediction of developing the NCD can help people to care more about their lifestyle behaviour even during the pandemic. Meanwhile, machine learning has become an integral part of improving the efficiency of prediction in healthcare. Data analysis using machine learning methods automates analytical model building based on the idea that systems can learn from data, identify patterns and make decisions. However, machine learning consists of various techniques that vary in the efficiency of the prediction of developing a disease. For NCD development prediction, which machine learning technique can provide the highest accuracy need to be researched. In this study, we propose the evaluation of various machine learning techniques to be utilised in predicting an individual risk in developing NCD using lifestyle behaviour data. The minimum parameter for the prediction dataset consists of age, gender, body weight, height, co-morbidity, etc. The first stage in processing the data involves data formatting, filtering and structuring. Then the prediction will be done in Decision Tree, Support Vector Machine (SVM) and Naive Bayes techniques using the orange tool. Each of these techniques has its strength and this study will determine which technique is the most suitable for predicting individual risk of developing the NCD. The major challenges for such predictions are the availability of dataset for training data. The results of this study will contribute to the knowledge of the accuracy of the prediction method, which can be used as a foundation for future research to improve the prediction of NCD development.

Keywords: Healthcare, NCD, Prediction and Machine learning.

OP17

The Impact of COVID-19 Pandemic on the Lifestyle of Saudi Population

Noara Alhusseini¹, Duaa Alammari², Majed Ramadan³, Nada Ziadeh⁴, Zineh Zyadeh⁴, Jude Alshamrani⁴, Hiba Qasim⁴, Noura Alamri⁵

¹ College of Medicine, Alfaisal University Riyadh, Saudi Arabia.

² College of Public Health and Health Informatics, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

³ King Abdullah International Medical Research Center, Riyadh, Saudi Arabia;
King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

⁴ College of Medicine, Alfaisal University

⁵ Department of Pediatric Oncology/hematology, King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia

COVID-19 emerged in December 2019 and outspread globally. As a result, sudden and a major change occurred in the governmental regulations to combat the pandemic, which affected the lifestyles of people worldwide. Lifestyle factors are changeable habits and routine behaviors such as dietary habits, physical activity, sleeping patterns, smoking, and alcohol intake that are necessary to maintain a healthy body to effectively cope with stress and to support the immune system. The objective is to assess the impact of COVID-19 on lifestyle factors among the Saudi population. This is a cross-sectional study among adults in Saudi Arabia. An online survey was distributed via social media channels including lifestyle factors related questions before and during lockdown. Bowker test, and McNemar's Test were performed to evaluate the effects of lockdown on lifestyle factors. A total of 1,051 participants were included in the study. A slight decrease in the overall diet score during the pandemic (14.98%) compared to before the pandemic (15.05%) (p-value=0.02), indicating poorer dietary intake during the lockdown. An increase in physical activities for three or more times was reported. A higher proportion of respondents reported sleeping nine or more hours a day during the lockdown 10.8%. Similarly, higher percentage of individuals reported smoking daily during the lockdown 12.2%. As of overall health status, higher percentage of respondents reported poor health status during lockdown (6.1%). COVID-19 played a major role in changing lifestyle factors among adults in Saudi Arabia. This study revealed major negative shifts in lifestyle factors especially among dietary habits and smoking patterns. The Saudi population needs education on healthy lifestyle factors that strengthen the immune system to combat COVID-19. Therefore, healthcare providers and public health officials are encouraged to increase awareness programs about healthy lifestyles to improve the health and well-being of the Saudi population especially during pandemics.

Keywords: Lifestyle, COVID-19, Saudi Arabia, Dietary habits, Physical activity, Smoking, Alcohol intake and Quarantine

OP18

Turkish Parent's Knowledge and Attitude Toward Childhood Vaccines

Ali Özlem¹, Arzu Özlem², Mesut Koçak³, Nimetcan Mehmet²

¹ Pediatric Department, Sincan Government Hospital Ankara

² Public Health Department, Faculty of Medicine, Ankara Yildirm Beyazit University

³ Pediatric Department, Ankara City Hospital

Parent's knowledge and attitude play an important role for childhood immunization. This study aims to assess parent's knowledge and attitude towards childhood vaccines. A cross-sectional study was conducted among 941 parents at Child Health and Diseases Polyclinics of Ankara Keçiören Education and Research Hospital. The data was collected using a questionnaire administered to Turkish-speaking mothers and fathers with children between 6 months to 7 years of age. A total of 809 mothers and 132 fathers participated in the survey. The results show that 67.4% of parents have a high level of knowledge about vaccines. It was found that 72.2% of the parents had good attitudes about vaccines. Health workers had higher knowledge related to vaccine than those in other professions both for mothers and fathers (87.0%, 88.6%, respectively). Mothers and fathers who graduated from university had higher knowledge about vaccines than parents with lower education levels (77.6%, 77.3%, respectively). Those who have high income had better knowledge levels than other parents (79.5%, $P < 0.05$). No statistically significant difference was found between parent's attitudes to vaccines and mother's and father's age, occupation and education ($P > 0.05$). More parents with a single children have bad attitudes to vaccines (35.4%) than those with two children and more than two children (19,9% and 29,8% respectively). Two thirds (67.4%) of the participants have good knowledge of childhood immunization while 72.2% of the participants have good attitude towards childhood immunization. Generally, Turkish parents have a good knowledge and attitude towards childhood immunization in this study.

Keywords: Childhood vaccines, Knowledge and Attitude

OP19

Attitude Towards Anti-Smoking Measures and Its Associated Factors Among Adults in Sub-urban Area, in Kuala Terengganu, Terengganu, Malaysia

San San Oo¹, Myat Moe Thwe Aung¹, Mohd Salami Ibrahim^{2*}, Charan Kishor Shetty³, Nyi Nyi Naing¹, Intan Suhana Munira Mat Azmi¹, Aniza Abd Aziz¹, San Thitsa Aung⁴

¹ Community Medicine Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA) UniSZA Medical Campus, Kuala Terengganu, Malaysia

² Medical Education Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA) UniSZA Medical Campus, Kuala Terengganu, Malaysia

³ Forensic Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA), UniSZA Medical Campus, Kuala Terengganu, Malaysia

⁴ Paediatric Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA) UniSZA Medical Campus, Kuala Terengganu, Malaysia

Cigarette smoking is a single factor associated with the most morbidity and mortality. Consequently, the Malaysian government in 2017 has gazetted Batu Buruk beach, a major Kuala Terengganu tourist attraction, as a smoking-free area. The legislation was preceded by a few years of government-backed systematic awareness campaigns. In response, this study aimed to establish the local community's attitude towards anti-smoking measures and its associated factors. This cross-sectional study employed validated questionnaires which were administered to two residential areas next to the Batu Buruk beach. A total of 295 adults were participating. Multiple linear regression with forward method was applied to identify the associated factors of the community attitude towards anti-smoking measures. The results were presented using crude and adjusted regression coefficient (b) and p value. Most of the respondents were Malays (96.6%), married (64.4%), attained up to the secondary school level (45.4%) and employed (59.7%). There was highly favorable attitude towards anti-smoking measures with mean value of the total attitude scores at 181.86 (range: 70-200). After multivariable analysis, the final model results showed having monthly income of RM 1000 and above ($p = 0.005$) and being a current daily smoker ($p < 0.001$) were significantly associated with the total attitude scores towards anti-smoking measures. Those having higher monthly income had a higher total attitude scores (adjusted b: 6.91, 95% CI: 2.15, 11.66). The current smokers, in contrast, had a lower total attitude scores towards anti-smoking measures than non-smokers (adjusted b: -23.30, 95% CI: -29.55, -17.05). Our study brings crucial evidence to adopt precision-measure public health strategy against smoking. Engineering successful anti-smoking legislation with productive educational campaigns need to factor in different magnitude of resource investment based on economic advantage and prevalence of smokers. Therefore, profiling target population by income status and smoking status will likely harvest more effective and cost-efficient interventions.

Keywords: Smoking, Smoking-free area, Smoking attitude, Batu Buruk, Kuala Terengganu, Terengganu Bebas Asap Rokok and TBAR.

OP20

Handwashing Practice and Its Associated Factors among Undergraduate Students in Malaysia During COVID-19 Pandemic

Safiya Amaran, Nik Nor Ronaidi Nik Mahdi, Intan Suhana Munira Mat Azmi, Aniza Abd Aziz, Rahmah Mohd Amin, Myat Moe Thwe Aung, San San Oo, Nyi Nyi Naing, Yuzana Mohd Yusop.

Universiti Sultan Zainal Abidin, Kampus Perubatan, Kuala Terengganu, Malaysia

Closure of educational institutions has been part of public health and social measures, implemented in many countries during massive waves of COVID-19 pandemic as these institutions are exactly the areas where mass gathering and extensive social interactions occurs daily. Gradually, opening of the educational institutions has been started in Malaysia, relying on the new norms including social and physical distancing, facemask wearing and handwashing. Proper handwashing techniques and habits are extremely important in preventing the spread the SARS-CoV-2. This study assessed the handwashing practice and factors influencing it among undergraduate public university students during COVID-19 pandemic. A cross-sectional study was conducted from May to July 2020 involving 273 undergraduate students whom were randomly selected from 10 faculties in a public university in Terengganu, Malaysia. Data collection was done online using validated questionnaire. Data analysis was done using SPSS version 22. Result from this study showed that the undergraduate university students had good knowledge, attitude and practice regarding handwashing during COVID-19 pandemic. The factors that were significantly associated with their handwashing practice include knowledge on handwashing ($b=0.72$, 95% CI 0.11, 1.32, $p=0.021$), attitude on handwashing ($b=1.04$, 95% CI 0.69, 1.38, $p <0.001$) and barrier at campus ($b=0.92$, 95% CI 0.30, 1.54, $p = 0.004$). In conclusion, knowledge, attitude, practice and barriers with regards to handwashing are very important. University can play an important role in continuously educating students regarding the prevention of COVID-19 and identify the barrier to handwashing in campus. University should also provide adequate facility to support handwashing practice among university students. Ability to comply with proper handwashing as one of the new social norms would be a significant contributing factor determining the success in preventing COVID-19 spread in educational institutions.

Keyword: COVID-19, Handwashing, University, Undergraduate, Practice, Knowledge, Attitude and New norms.

OP21

Risk Perception in Childhood Vaccination: A Validation Study on Pregnant Mothers in Malaysia

Mohd Nazir Mohd Nazori¹, Rohani Ismail¹, Nur Syahmina Rasudin¹, Rosminah Mohamed¹, Norhayati Mohd Noor², Zailiza Sulli³, Noor Azliah Ahmad Zainuri⁴, Masitah Mohamed⁵, Ashvini d/o Jayapalan⁶

¹ School of Health Sciences, Universiti Sains Malaysia Health Campus, 16150 Kota Bharu, Kelantan, Malaysia

² School of Medical Sciences, Universiti Sains Malaysia Health Campus, 16150 Kota Bharu, Kelantan, Malaysia

³ Hulu Langat Health District Office, Kementerian Kesihatan Malaysia, 43000 Kajang, Selangor, Malaysia

⁴ Petaling Health District Office, Kementerian Kesihatan Malaysia, 47301 Petaling, Selangor, Malaysia

⁵ Klang Health District Office, Kementerian Kesihatan Malaysia, 41200 Klang, Selangor, Malaysia

⁶ Gombak Health District Office, Kementerian Kesihatan Malaysia, 68100 Batu Caves, Selangor, Malaysia

Quantitative study on risk perception in vaccination encompasses various theoretical basis, health context, and psychometric validity and reliability. In the context of basic childhood vaccination, there was a lack of locally validated and reliable instrument to measure risk perception for vaccine-preventable disease. As such, this study aimed to validate and assess reliability of adopted instruments in Malay language. Items were generated from available items in previous research and adopting recommendations on operationalising the construct. Generated items were measured for content validity index by seven experts, tested for factorial validity using exploratory (EFA) and confirmatory factor analysis (CFA) using structural equation modelling. Predictive validity was established against vaccination knowledge and intention using Spearman-rank correlation. Reliability was established using Cronbach's alpha and composite reliability (CR). Seven items measured perceived likelihood whereas eight items measured perceived severity. Reliability index was 0.97 for perceived likelihood and 0.94 for perceived severity. CFA on second-order measurement model revealed satisfactory model fit; χ^2/df (2.69), CFI 0.978, TLI 0.973, SRMR 0.0375, and RMSEA 0.064. The average variance explained was 0.725 for perceived likelihood and 0.727 for perceived severity and CR was 0.948 and 0.955 for perceived likelihood and perceived severity, respectively. Both constructs showed significant positive correlation with vaccination knowledge and intention, establishing predictive validity. Thus, the Malay risk perception questionnaire established good content, factorial, and predictive validity with good reliability on Cronbach's alpha and CR. The instrument should be valuable to re-examine risk perception's role in the resurgence of vaccine hesitancy in the local population.

Keywords: Risk perception, Questionnaire validation, Vaccination and Structural equation modelling

POSTER PRESENTATION

POST1

Air Pollution and Real Time Hospital Admissions for Eczema and Asthma in Kuala Lumpur, Malaysia.

Thavin Kumar Mathana Sundram^{1,2}, Eugenie Sin Sing Tan¹, Shiau Chuen Cheah¹, Hwee San Lim³, Marjan Sadat Seghayat⁴, Normina Ahmad Bustami¹, Chung Keat Tan¹

¹ Faculty of Medicine and Health Sciences, UCSI University, 56000 Kuala Lumpur, Malaysia ² Faculty of Applied Sciences, UCSI University, 56000 Cheras, Kuala Lumpur, Malaysia

³ School of Physics, Universiti Sains Malaysia, 11800, Gelugor, Pulau Pinang, Malaysia

⁴ Faculty of Medicine, Bioscience & Nursing, MAHSA University 42610 Jenjarom, Selangor, Malaysia

Global disease burden attributable to air pollution has remained a major issue of concern over the years. Epidemiological findings on air pollution adverse effects to human respiratory and skin however remain limited with regards to disease burden assessment in Malaysian. Thus, this study aimed to compare association of ambient air PM_{2.5} concentration with real time hospital admission rate for eczema and asthma specifically in a single healthcare facility at Kuala Lumpur. An 18 months cross-sectional study was conducted. Daily ambient PM_{2.5} concentrations at 5-minute interval was collected at a designated sampling station using a DustTrak™ Aerosol Monitor Model 8520. Patient demographics and admission case profile of eczema and asthma patients were extracted respectively from Hospital Information System (HIS) of University Malaya Medical Centre. Admission of patients outside the geographical region of interest were excluded in this study. A total of 44 eczema and 674 asthma cases were extracted from the hospital database. Major proportion of patients admitted were of the age category below 20 and above 60 for both conditions. A moderate negative correlation ($r=-0.539$) was reported between ambient PM_{2.5} concentrations with admission due to eczema. As for admission due to asthma, a negligible negative correlation ($r=-0.127$) was reported against PM_{2.5} concentration. When analysed by asthma subtypes, both unspecified asthma and predominately allergic asthma established a negligible correlation of $r=-0.229$ and $r=-0.250$ respectively. However, a weak negative correlation ($r= -0.446$) was reported for status asthmaticus admission cases. In summary, the findings are suggestive of a potential relationship between PM_{2.5} concentration and hospital admission cases of eczema and asthma that could serve as evidence for future studies though a causal link could not be established.

Keywords: Air pollution, PM_{2.5}, Eczema, Asthma and Admission

POST2

Estimating Healthcare Cost for Type 2 Diabetes Mellitus Management Using Real-World Data

Heng Kai Qing, Ng Chin Hui

Pharmacy Department, Hospital Raja Permaisuri Bainun, Ministry of Health Malaysia

The cost of illness study provided an insight into the economic burden of the healthcare system. The objective was to compile all related data to identify the annual cost of managing Type 2 Diabetes Mellitus (T2DM). Bottom-up approaches were used to identify events and resources consumed for a year after initiating Empagliflozin. Data was collected from bin card records in the pharmacy department and medical records from the Hospital Information System. All patients who initiated Empagliflozin between 1st January 2018 and 31st December 2019 were recruited. The cost accrued was based on the price listed by the Attorney General's Chambers of Malaysia for foreigners, public hospital medication procurement price, and private pathology labs. Of the patients, 92 identified, 27 were excluded. Eight out of 65 patients have at least one admission with the mean of 7-days (SD=6 days) of hospital stay and the mean total cost of hospitalization was RM2,410. One out of 14 hospitalization episodes was due to diabetes-related complications. The mean annual management cost for them treated in the outpatient setting was slightly higher, not statistically significant than patients without admission (RM4,076, SD=RM3,394 VS RM3,857, SD=RM2,587, $p>0.05$). The mean number of medical outpatient clinic visit was 7 and 4 per year for patients with and without hospitalization, respectively. Overall, more than a quarter of the total cost of management was contributed from laboratory tests regardless they have a history of hospitalization. Patients who have insulin therapy have two-fold higher medication cost (RM3,001 VS RM1,348) compared to without insulin therapy. The findings presented the updated resources and healthcare expenditure of managing T2DM patients with comorbidity diseases in the Malaysian public healthcare setting.

Keywords: Type 2 diabetes mellitus, Healthcare and Cost.

POST3

Quality of Life, Willingness-to-Pay and Time Trade-Off for Periorbital Hyperpigmentation

Chung Keat Tan¹, Chin Chwen Ch'ng², Thavin Kumar Manthana Sundram³, Shiau Chuen Cheah⁴, Chew Kek Lee⁵, Yin Nwe Aung⁴, Navedur Rehman⁶, Farahnaz Amini¹, Eugenie Sin Sinq Tan¹

¹ Faculty of Medicine and Health Sciences, UCSI University, Jalan Menara Gading, UCSI Heights, Cheras, Kuala Lumpur

² Subang Jaya Medical Centre, Jalan SS12/1A, Subang Jaya, Selangor, Malaysia

³ Cardiac Vascular Sentral Kuala Lumpur, Jalan Stesen Sentral, Kuala Lumpur, Malaysia

⁴ Faculty of Medicine and Health Sciences, UCSI University Springhill Campus, Port Dickson, Negeri Sembilan, Malaysia

⁵ Sunway Medical Centre Velocity, Lingkaran SV, Sunway Velocity, Kuala Lumpur

⁶ Wahat AlShifa Polyclinics, Medina, Saudi Arabia

Periorbital hyperpigmentation (POH) is defined as bilateral, round, homogenous pigment macules on the infraorbital regions. The condition is more evident in some ethnic groups and is commonly seen in multiple family members. Although it doesn't signify underlying diseases and causes morbidity, POH disrupts emotional well-being by decreasing the patient's self-confidence and reducing interest to socialize. This study aimed to measure the health state utilities of POH patients using health status and preference-based measurements for various treatment modalities such as light and laser therapy, chemical peeling and topicals. A non-interventional, cross-sectional questionnaire with convenient sampling was conducted involving respondents with self-perceived POH. The questionnaire consisted of sociodemographic and clinical information, Dermatology Life Quality Index (DLQI), Willingness-to-Pay (WTP) and Time Trade-Off (TTO). One hundred respondents were recruited with a male to female ratio of 1:2.6. The most common skin types were type III and IV with 43% and 47%. Respondent's self-assessed POH severity was mild (50%), moderate (43%) and severe (7%). DLQI scores showed that respondents' Quality of Life (QOL) were mostly (64%) not impaired, 29% mildly impaired, 4% moderately impaired, and 3% severely impaired. Mean DLQI scores for this study was 1.87 ± 3.0 which was lower than those previously reported. Embarrassment or self-consciousness due to POH was reported by almost half of the respondents in our study. Respondents were willing to pay a mean amount of RM 68.82 (16 USD) for topical treatment, RM 114.41 (27 USD) for chemical peels and RM 271.91 (64.50 USD) for light and laser. TTO was reported to be 1.72 hours for light and laser, 1.06 hours for chemical peels and 9.54 minutes for topical treatment. As a conclusion, QoL impairment of POH was mild, and intention to treat with topicals were reported.

Keywords: Periorbital hyperpigmentation (POH), Dermatology life quality index (DLQI), Quality of life (QOL), Willingness-to-Pay (WTP) and Time-trade off (TTO)

POST4

Interior Design Quality of Obstetrics and Gynaecology Wards in Malaysian Public Hospitals: A Qualitative Study

Shariffah Syafiqah Aljunid, Mohd Zafrullah Mohd Taib, Zanariah Abu Samah

Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Malaysia.

Interior design plays a significant role in patient satisfaction with the healthcare environment. Studies have shown that people spend 90% of their time indoors during hospital admissions. Hence minor design decisions can drastically improve patients' quality of stay and help their healing process. Furthermore, in the inpatient settings the environment is typically overwhelming, confused, and stressful for the patients. This study aims to assess the interior design quality of the inpatient wards in public hospitals in Malaysia focusing on the aspects of space planning, privacy, materials and finishes, and air quality using qualitative approach with the utilization of NVivo for the analysis. Semi-structured interviews with 29 patients and on-site observation were conducted in five Obstetrics and Gynaecology wards from five public hospitals in Klang Valley region. The interview results showed that the patient was satisfied with the overall interior design quality, while the on-site observation shows that all aspects mostly demonstrated positive qualities than negative qualities. Therefore, the overall state condition of the wards is classified as satisfactory. Nonetheless, this study managed to identify several issues in terms of what is lacking inside the ward space for future considerations. In conclusion, this study represents an attempt to support the significance of good interior design in improving patient satisfaction. It shows significant progress in understanding the current physical condition of the country's healthcare facilities, while providing information for professionals to design better wards in the future.

Keywords: Interior design, Quality, Patient satisfaction, Inpatient ward and public hospital

POST5

Who Define Daily Dose Utilization Review Of Analgesics In Primary Health Clinics

Manan Mm, Raja Arrif Rn, Hanish Singh Jc, Ibrahim N.

Department Of Pharmacy Practice, Faculty Of Pharmacy, Mara University Of Technology, Puncak Alam, Malaysia.

The Third National Health and Morbidity Survey in 2006 described chronic pain and it shows that about 7.1% of adults in Malaysia experienced chronic pain. Pain is the main reason for medical consultation, especially in primary care clinics. The utilization of analgesics is not without risk and has now become one of a major public health issue. One of the methods to ascertain this issue is to conduct a drug utilization review. The objective of the study was to evaluate the drug utilization review of analgesics in Johor Bahru primary health clinics. The data of patients prescribed with analgesics from January to December 2019 from three selected clinics. All clinics have electronic prescribing system called Tele Primary Care (TPC). where MAI score were calculated for each analgesic's prescribed. Sample size was calculated using Naing et al. formula and random sampling was performed by using computer-generated randomization. A total of 409 patients records were included. Based on the calculated DDD/1000 inhabitants/day, the most commonly used analgesics were Mefenamic Acid (0.4862), Diclofenac (0.271) Tramadol (0.0375), Meloxicam (0.0214) and Ibuprofen (0.003). Overall analgesics prescription is appropriate with an average of 94.29% MAI score of 0 to 4. The most chronic comorbidities hypertension (10.16%), combination of both hypertension and diabetes mellitus (5.31%) and diabetes mellitus (3.81%). Utilization pattern of analgesics in Johor Bahru primary health clinics is appropriate. However, analgesics need to be cautiously prescribed to patients with chronic conditions and concomitant use of antiplatelet and antihypertensive medication to prevent the risk of an adverse event in this group of patients.

Keywords: Analgesics, Primary Health Clinics and Drug utilization review.

POST6

A Review Of Antithrombotics Defined Daily Dose In A Tertiary Care Hospital

Manan Mm, Baharuddin Ay, Hanish Singh Jc, Ibrahim N.

Department Of Pharmacy, Faculty Of Pharmacy, Mara University Of Technology, Puncak Alam, Malaysia.

Antithrombotics are being used for many indications in both prophylaxis and therapeutic treatment. It is often associated with high risk of adverse effects; hence a drug utilization evaluation is essential. The main objective of the study was to describe the utilization of antithrombotic drugs in terms of “Defined Daily Dose (DDD) toward rational use and factors that influence the pattern of use of the drugs. This was a retrospective study where the data was from a tertiary care hospital in Selangor. Defined daily dose (DDD) per 1000 inhabitants/day was calculated to estimate on patients with thromboembolic disorders in receiving standard treatment on a daily basis. Malaysian CPG on the Prevention and Treatment of Venous Thromboembolism 2013, Ministry of Health acts as a tool to evaluate the quality of prescribing. The results showed DDDs correlation with gender, race and age group. Warfarin was the most commonly utilized for treatment as well as prophylaxis in various disciplines with 1.82 DDD followed by Enoxaparin with 1.05 DDD and tinzaparin with 0.39 DDD. For antiplatelet drugs, acetylsalicylic acid was the most utilized antiplatelet with 8.5 DDD followed by clopidogrel 1.42 DDD and ticlopidine 0.16 DDD. The utilization pattern for all the antithrombotic drugs is in accordance to the WHO DDD and Malaysian CPG. The application of DDD analysis is a good practice conducted at planned intervals as it is a tool to update the changing or even new pattern of drug usage that assist in justification of rational use of drugs.

Keywords: Antithrombotic, Hospital and Defined Daily Dose

POST7

The Impact of the ABC-VEN System on The Drug Inventory Management in Malaysian Public Hospital

Manan Mm, Zainal Abidin Kn, Hanish Singh Jc, Mohd Saman K

Department Of Pharmacy Practice, Faculty Of Pharmacy, Mara University Of Technology Puncak Alam, Malaysia

Sustaining a continuous supply of medications is an issue in highly subsidized public health-care services. To ensure seamless and efficient medication supply, an effective inventory management and excellent logistics support is crucial. In Malaysian public hospitals, the ABC-VEN system is the drug inventory management utilized for this purpose. Thus this research project to examine the impact of the ABC-VEN drug inventory system management. This study will focus on the application of the ABC-VEN system on drug purchase. Data is based on drug expenditure and drug indent for the year 2018, 2019 and from January to June 2020. The Inpatient and Outpatient Pharmacy inventory data are the main centres for drugs supply. It is also closely link to actual use and trend of prescribed medications. Analysis on the trend of drug purchase and drug indent is to identify the impact of the ABC-VEN system. The total expenditure of drugs for 2018, 2019 and 2020 in Malaysian Ringgit (RM) were RM38,58 million, RM43,22 million, and RM22.24 million respectively. Purchases for year 2018, 2019 and 2020 showed more than 70% of the budget comprises of Category I items and in line with the ABC concept. However, purchased of non-essential drugs had increased drastically from 34% in 2018 to 54.4% in 2019, but decreased to 31.1% in 2020. Several groups of drugs require strict control on purchasing and movement as these drugs are in the category of highest drug expenditure. The changes are observed to be in-line to current policies. The findings on drug ABC-VEN stock/indent ratio demonstrate flexibility of the system to the hospital needs for drug purchase and usage. These results showed that the ABC-VEN system main impact is the effective monitoring the trend and pattern of the purchase and indent of medications.

Keywords: ABC-VEN, Inventory, Drug and Hospital

POST8

Health-related Quality of Life in Patients with Cancer-associated Thrombosis

Azmi Nor Mohd Farez Ahmat^{1,2}, Sharifa Ezat Wan Puteh¹, Suhana Yusak³, Roszita Ibrahim¹

¹ Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

² Department of Pharmacy, National Cancer Institute, Putrajaya, Malaysia

³ Department of Radiotherapy and Oncology, National Cancer Institute, Putrajaya, Malaysia

Cancer-associated thrombosis (CAT) is an important health problem among cancer patients. Health-related Quality of life (HRQoL) is known to be impaired in patient who experiences thrombosis. Although many studies have been published, none of it was done in the cancer population. The aim of this study was to assess the HRQoL in patients with CAT and to investigate possible predictors for impaired HRQoL. Cancer patient with CAT were recruited cross-sectionally between November 2019 to May 2020 at the national tertiary cancer center. HRQoL were evaluated using the generic EQ-5D-5L with visual analogue scale. Logistic regression analysis was conducted to determine the factors influencing HRQoL. A total of 80 respondents participated, more than half were malay (63.8%) and female (66.2%). Majority of patient were diagnosed with advanced/metastatic disease (88.8%) and experiencing deep vein thrombosis (57.5%). The most common problems related to the quality of life among patients with cancer-associated thrombosis were pain or discomfort (52.5%), followed by mobility (45%), usual activity (45%), and anxiety or depression (38.8%). The utility index of all patients was 0.7584 (0.276) with a VAS score of 72.31 (17.91). The utility score and VAS scores were higher in patients receiving direct-oral anticoagulant (DOAC) compared to subcutaneous anticoagulant. Recurrence, advanced/metastatic disease, poor performance status, and diagnosed with pulmonary embolism were associated with a lower utility value. Cancer-associated thrombosis had a negative impact on HRQoL. With improved HRQoL, DOAC can be an alternative to subcutaneous anticoagulants. The HRQoL could be used in future economic model studies.

Keywords: Cancer-associated thrombosis, EQ-5D, Health-related quality of life and Tumours and Anticoagulant.

POST9

Burnout's Prevalence and Its Associated Factors for Frontline Healthcare Workers in Johor's Health District Offices During COVID-19 Pandemic; A Cross-Sectional Study”

Ibrahim Farha¹, Samsudin Ely Zarina¹, Toha Haidar Rizal², Chen Xin Wee¹, Zaliha Ismail¹

¹ *Department of Public Health Medicine, Faculty of Medicine, University Teknologi MARA, Selangor, Malaysia*

² *Johor Bahru District Health Office, Johor Health State Department, Johor, Malaysia*

The unprecedented crisis of Coronavirus Disease 2019 (COVID-19) has placed frontline healthcare workers (FLHCWs) under considerable job strain, increasing their predisposition to burnout. However, literature on burnout and its associated factors among FLHCWs in the public health setting during the COVID-19 pandemic remain scarce. Thus, this study is conducted to assess the prevalence of burnout and to examine the association of sociodemographic and work-related factors with burnout among FLHCWs in Johor district health offices (DHOs) during COVID-19 pandemic. A multicenter cross-sectional study including 508 FLHCWs from all ten DHOs in Johor was conducted. Eligible FLHCWs were sampled using stratified random sampling. A self-administered questionnaire via Google Form assessing sociodemographic factors, work-related factors, and burnout were used to examine burnout and its associated factors. From this study, it was found that the prevalence of burnout among study participants was 45%. In terms of sociodemographic factors, older participants had lower odds of burnout compared to those who were younger (Adjusted odds ratio (AOR) 0.96; 95% Confidence Interval (CI): 0.93,0.99). Work-related factors including duration of involvement with COVID-19 of over six months (AOR 2.35; 95% CI: 1.16,4.72), medium (AOR 2.10; 95% CI: 1.27,3.48) and high levels of emotional demand (AOR 4.45; 95% CI: 1.67,11.77), low (AOR 2.10; 95% CI: 1.27, 3.48) and medium level of role clarity (AOR 4.18; 95% CI: 1.64,10.59), medium level of job satisfaction (AOR 3.21; 95% CI: 1.11,9.29) and low level of organizational justice (AOR 3.32; 95% CI: 1.51,7.27) were significantly associated with burnout. In conclusion, this study demonstrates that burnout is a common occurrence among FLHCWs working in public health settings during the COVID-19 pandemic. Given the severity of the consequences, policies addressing job content and targeted interventions especially for those involved in the COVID-19 pandemic for prolonged periods should be developed to prevent and mitigate this problem.

Keywords: Burnout, Frontline healthcare worker, public health, Work-related factors and COVID-19

POST10

Does Provider Payment Method Improve the Completeness of Medical Records? A Study on the Impact of the Casemix System on Medical Record Documentation in a Public Specialist Hospital in West Sumatra Province, Indonesia

Kamal Kasra^{1,3}, Syed Mohamed Aljunid^{1,2}, Amrizal M. Nur²

¹ International Centre for Casemix and Clinical Coding, Faculty of Medicine, Universiti Kebangsaan Malaysia

² Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait

³ Fakultas Kesehatan Masyarakat, Universitas Andalas, Sumatera Barat

In 2010, the Government of the Republic of Indonesia implemented a casemix system called INA-CBG (Indonesia Case-based Group) as a provider payment method for the National Health Insurance program. One of the obstacles in the implementation of casemix system as prospective provider payment method in the incompleteness of medical record documentation. This cross-sectional study aimed to assess the impact of casemix implementation on medical record documentation. The study was conducted at the National Stroke Centre Hospital, Bukittinggi, West Sumatra Province, Indonesia, which is the only government specialist hospital for stroke patients in Indonesia. Samples were collected from 244 and 559 medical records in various specialities from 2008 and 2012, respectively. This study used a chi-squared test to differentiate the completeness of medical records before and after the casemix implementation. This study found that the completeness of medical records improved significantly from 59.4% to 73.9% with casemix implementation. Information that was grossly incomplete in both years are the main procedure, patients' age, and secondary diagnoses. The three items that showed significant improvement after implementation of casemix were admission date, length of stay, and secondary diagnosis. In conclusion, implementation of the casemix system in the National Health Insurance improved the completeness of the medical records and had a positive impact on medical record documentation.

Keywords: Casemix, Completeness, Medical Records and Provider Payment

POST11

Cost-Effectiveness of Ribociclib for Post-Menopausal, HR+/HER2- Advanced Breast Cancer in Malaysia

Ibtisam Muhd Nor¹, Adrian Goh², Noelle Wong³, Balraj Sethi³

¹ Dept of Radiotherapy & Oncology, Hospital Kuala Lumpur

² CONEXTS Kuala Lumpur

³ Novartis Oncology Malaysia

Breast cancer is the most common cancer among Malaysian women, with 33% of incident cases and 23.4% of cancer deaths reported in Globocan 2018. The National Cancer Registry Report 2012-2016 reported that close to 50% of breast cancer patients were diagnosed with stage III-IV disease and HR+/HER2- is the most common subtype of breast cancer among Malaysian women. Ribociclib is an oral, highly selective CDK 4/6 inhibitor that is recommended as first-line treatment for HR+/HER2- advanced breast cancer in pre- and post-menopausal women. This study aimed to examine the cost-effectiveness of ribociclib/letrozole combination vs letrozole monotherapy in postmenopausal patients. A model comprised of three health states: progression free survival (PFS), post-progression disease, and all-cause death, was adapted for the analysis. Health state transition probabilities were estimated through parametric modelling of data from the MONALEESA-2 clinical trial (January 2017 data cut). Health state utility was modelled from EQ-5D-5L data from MONALEESA-2 while adverse events disutility was derived from published literature. Analysis was performed from the MOH perspective, thus direct medical costs borne by the MOH for the lifelong care of ABC patients, from first line treatment to progressed disease and palliative care were included. All costs and benefits were discounted at 3% p.a. to the index year of analysis (2019). Treatment with ribociclib+letrozole resulted in a gain of 4.58 QALY with lifetime discounted cost of RM173,317 vs 2.95 QALY for letrozole monotherapy with cost of RM66,296. The ICER of ribociclib+letrozole vs letrozole was RM65,693 per incremental QALY, or 1.4 times GDP per capita. Probabilistic sensitivity analysis estimated a 96% probability of ribociclib+letrozole being cost-effective at the WHO suggested ICER threshold of three times GDP per capita. Ribociclib+letrozole is cost-effective compared to letrozole monotherapy as first line treatment for HR+/HER2- aBC with from the perspective of the MOH Malaysia.

Keywords: Cost-effective, HR+/HER2-, Advanced breast cancer, Ribociclib, Letrozole and Malaysia

POST12

Real World Efficacy and Safety of Empagliflozin in Type 2 Diabetes Mellitus Patients: Experience from a Tertiary Care Hospital

Liou Pui Yan¹, Ng Chin Hui ¹

¹ Pharmacy Department, Hospital Raja Permaisuri Bainun, Ministry of Health Malaysia

The clinical benefits of Empagliflozin in Type 2 Diabetes Mellitus (T2DM) promoted the use of the medication but the real-world data was limited. The objective of the study was to evaluate the real-world clinical efficacy and safety in T2DM patients in a tertiary care hospital in Malaysia. It was a retrospective study. All patients prescribed with Empagliflozin between 1st January 2018 and 31st December 2019 were extracted from bin card records in the pharmacy department. Then, the relevant clinical investigation data for the patients was retrieved from the database of the Hospital Information System. Demographic details, HbA1c, glomerular filtration rate (GFR), lipids, insulin use, and history of cardiovascular disease (CVD) and adverse events were analyzed. Patients who discontinued the medication within one year, did not return for follow-up, or had incomplete data were excluded from the analysis. Of the 92 patients identified, 27 were excluded. The common dose for Empagliflozin was 12.5mg/day (n=47). 65% of T2DM patients have insulin therapy before the start of Empagliflozin. There was an average improvement in lipid profile, reduction of 0.04mg/dl (Z=-0.721, p=0.471) for LDL serum level, 0.07 mg/dl (Z=-1.351, p=0.177) for triglyceride serum level and 0.06mg/dl (Z=-0.822, p=0.411) for total cholesterol serum level after using Empagliflozin. There was a mean increment of 0.005mg/dl (Z=-0.284, p=0.7764) for HDL serum after initiating of Empagliflozin. There was a statistically significant reduction of 1.01% (Z=-4.519, p=0.00) of HbA1c after initiating Empagliflozin use, but it did not elicit a statistically significant change in eGFR (Z=-1.655, p=0.098). No major adverse event was reported for patients. One year follow-up showed initiating Empagliflozin improves glycemic and lipid profile level. At the same time, it also delayed the deterioration of kidney function in patients with T2DM.

Keywords: Type 2 diabetes, Empagliflozin, HbA1c, eGfr and Lipid

POST13

Estimating the Hospitalization Cost of Influenza in Malaysia

Nur Syazana Mad Tahir^{1,2}, Ahmed Abdelmajed Alkhodary^{1,3}, Syed Mohamed Aljunid^{3,4}, Aniza Ismail¹, Aznida Firzah Abdul Aziz⁵

¹ Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia

² Ministry of Health Malaysia, Federal Government Administrative Centre, Putrajaya, Malaysia

³ International Centre for Casemix and Clinical Coding, Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia

⁴ Department of Health Policy and Management, Faculty of Public Health, Kuwait University, Kuwait

⁵ Department of Family Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia

Influenza is a viral disease that can affect all age groups and causes significant morbidity and mortality worldwide. Estimating the healthcare cost of such a disease allows for better allocation of necessary funds to provide quality services and contain future costs. The aim of this study is to estimate the provider's cost for managing Influenza at a teaching hospital in Malaysia. The study included all reported hospitalization cases for the selected Influenza-related ICD 10 codes (J09, J10, J10.1, J10.8, J11, J11.1, J11.8, J12.8 and J12.9) between 2010 to 2020. A total of 1,599 inpatient cases were obtained from the casemix database of the International Center for Casemix and Clinical Coding at the National University of Malaysia. Patients with severity level I dominated the sample with more than half (56.5%) compared to severity level II (35.1%) and III (8.4%). Majority of the cases were aged less than 18 years (90.6%) followed by 60 years and above (4.8%), and 18-59 years (4.6%). The average length of stay (ALOS) was 6.33 days. The ALOS raised as the severity level increased across all age groups. Patients aged less than 18 years, 18-59 years, and 60 years and above, the ALOS was 5.79, 13.45, and 9.69 days, respectively. Influenza-related hospitalization mean cost was RM4,148 with a median of RM3,811 per episode of care. The highest cost was observed among those aged 60 years and above (RM5,870) followed by 18-59 years (RM5,660) and less than 18 years (RM3,979). The average cost for patients with severity level III was found to be the highest with RM7,087 and the median of RM6,771. In conclusion, the inpatient cost for management of influenza is substantial. Preventive action such as immunisation against influenza especially for the elderly can help to reduce the economic burden of this disease in the country.

Keywords: Influenza, Cost, Casemix and Malaysia.

POST14

COVID-19 Impacts on University Students in A Nutshell

Danish Oh Fahmi, Dina Batrisyia Adi Azhar, Mohd Shahizan Ali, Siti Farhannie Mohd Adnan

Aspirational International Synergy, Universiti Kebangsaan Malaysia.

Since early 2020, the Covid-19 pandemic has turned students' lives upside-down, mainly affecting their mental health. Omarian Aspirational International Synergy (OASIS), Universiti Kebangsaan Malaysia carried out a study to identify Covid-19 impacts towards university students. A follow-up online session named "Intellects Unite" invited student speakers from Universiti Kebangsaan Malaysia, Chulalongkorn University and Universitas Airlangga to share their experience surviving this pandemic as a university student in respective countries. An online survey was targeted among the students in Ungku Omar Residential College, via Google Forms, highlighted questions such as the impacts felt by the students in terms of mental health, economy and online learning along with its solutions. The survey showed online learning is mostly ineffective among the respondents. Poor communication between students and lecturers, unstable internet connection and overwhelming workload is the common aftermath of the current online learning in Malaysia. Solutions such as learning how to be an independent learner were suggested by the speakers. In terms of mental health, the survey showed 55% of the respondents were triggered by the stress caused by the pandemic. The lack of socializing and unhealthy work-life balance is the supporting pillars in deterioration of their mental well-being. Keeping up with the technology usage, maintaining good social and emotional support with family and friends may reduce the impact. Respondents were also not able to work part-time jobs leading to a financial crisis. Fresh graduates and small-medium entrepreneurs can no longer sustain the financial burden compared to larger firms and businesses. Initiatives done by the government and institution helped lighten the students burden significantly whether it is financial support or providing food and gadgets. The study concluded most university students in Malaysia, Thailand and Indonesia are experiencing major drawback in mental health, online learning and economy; immediate responses are required.

Keywords: Mental health, Online learning, COVID-19, Endemic and Pandemic.

POST15

A Group-Randomized Study Comparing the Traditional Lecture and Informal Cooperative Learning for Radiology Teaching Among Medical Students In a Malaysian University

Mohd Salami Ibrahim¹, Norhasiza Mat Jusoh^{2*}, Husbani Mohd Amen Rebutan², Myat Moe Thwe Aung³, Cheah Wai Hun², Abdul Rahman Esa⁴.

¹Medical Education Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA), UniSZA Medical Campus, Kuala Terengganu, Malaysia.

²Radiology Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA), UniSZA Medical Campus, Kuala Terengganu, Malaysia

³Community Medicine Unit, Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA) UniSZA Medical Campus, Kuala Terengganu, Malaysia

⁴Radiology Unit, Faculty of Medicine, UCSI University, Terengganu Campus, Marang, Terengganu, Malaysia.

The escalating emphasis for patient safety and competent medical practice in radiology demand a revised approach for the undergraduate training. The traditional lecture (TL) is susceptible towards passive learning, compromising the quality of education. In this study, we investigated the undergraduate radiology training via informal cooperative learning (ICL). We randomly delivered 11 radiology topics via the TL or the ICL to four clinical group of thirteen third-year undergraduate medical students. For each topic, two groups underwent the TL while the other two learned via the ICL. At the beginning of each class, all students underwent radiology knowledge pre-test via one best answer (OBA) and radiology skills pre-test via objective structure clinical examination (OSCE). The same tests were repeated for post-tests at the end of the class and six weeks later. Pre-test results showed no significant difference in OBA scores and OSCE scores between the ICL group and TL group. Students in both groups attain significantly higher scores of OBA and OSCE in all post-tests than the pre-tests. Additionally, students who learned from the ICL classes scored significantly higher in OBA immediately post-teaching, six weeks later, and the overall score regardless of time. There was no statistically significant difference in OSCE scores between the ICL and TL in all diets of assessment. Our study substantiated superior knowledge transfer and more sustained knowledge retention among medical students for radiology training via the ICL. Meanwhile, comparable gains on radiology skills from baseline between the ICL and TL suggested campus-based teachings are complementary but were not replacements for workplace-based radiology training. In the setting of virtual-based transition of education due to the COVID-19 pandemic, this study brings novel contribution for evidence-informed decision for policy and practice for the undergraduate radiology training that is likely applicable to the broader medical and higher education.

Keywords: Higher education, Radiology teaching and Informal cooperative learning

POST16

Drug Utilization Review on Intravenous Human Immunoglobulin at Hospital Taiping

Shea Jiun Choo¹, Kamariah Shamsinar Binti Kamarul Baharin¹, Chee Tao Chang², Kamen A/P Kalaiselvan¹, Shiek Lin Tay¹, Jer Chien Teoh¹, Yi Jing Ong¹, Chun Zheng Ng¹, Nur Nabilah Binti Habil¹

¹ Department of Pharmacy, Hospital Taiping, Perak,

² Clinical Research Centre, Hospital Raja Permaisuri Bainun, Perak

Intravenous human immunoglobulin (IVIg) is a blood product derived from human donor blood that contains a mixture of antibodies in intravenous injection forms. In Malaysia, IVIg is used for approved and off-label indications. This study aimed to evaluate IVIg utilization at Hospital Taiping, in terms of prescribing pattern, cost and evidence category. All patients who received IVIg treatment from January 2019 to December 2020 were included. Demographic data, indications of IVIg use and physician specialty were retrospectively retrieved from patients' medical records. The evidence category was determined according to the American Academy of Allergy, Asthma and Immunology. Lower evidence category was defined as indications not supported by randomised controlled trials. IVIg was most commonly prescribed in pediatrics (n = 26, 33.3%), followed by neurology (n = 20, 25.6%) and hematology (n = 14, 17.9%). Out of 78 patients, most indications were off-label according to local and international authorities: Malaysian Ministry of Health (n = 52, 66. %), U.S. Food and Drug Administration (n = 52, 66.7%) and European Medicines Agency (n = 46, 59.0%). Physician specialties (p = 0.004) were significantly associated with off-label use, mainly observed in rheumatology (n = 12, 15.4%) and neurology (n = 20, 25.6%). Off-label indications such as systemic lupus erythematosus and neonatal jaundice secondary to isoimmune haemolytic disease of newborn were significantly associated with lower evidence category (p < 0.001). The total cost of IVIg use was RM695,426.36, of which RM267,993.40 was spent on indications with lower evidence category (n = 37, 47.5%) and RM71,616.00 on cases which evidence category were not established (n = 12, 15.4%). Our findings show a greater than expected proportion of off-labelled IVIg use in low evidence categories. This study emphasizes the regular review of IVIg prescribing and the formulation of IVIg prescribing guidelines to justify its use.

Keywords: Intravenous immunoglobulin, IVIG, Approved indication, Cost, Evidence category, Physician specialty and Strength of recommendation