2nd PHARMACOECONOMICS AND OUTCOME RESEARCH CONFERENCE 2014

"PHARMACOECONOMICS IN HEALTHCARE TRANSFORMATION: TOWARDS UNIVERSAL COVERAGE"

THE ROYALE CHULAN, KUALA LUMPUR, MALAYSIA • 7-9 MARCH 2014
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Organising Chairperson: Dr. Soraya Azmi  
Secretaries: Lee Sit Wai and Nurul Azwani Nadia Mansor  
Treasurer: Kathleen Yeoh

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|
First and foremost, I would like to thank the organizers for the invitation to pen a few words on the occasion of the 2nd Pharmacoeconomics and Outcome Research Conference 2014. Heartiest congratulations to the organizers of this important conference - the Malaysian Society for Pharmacoeconomics and Outcome Research (MySPOR), which is a chapter of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR). I would also like to thank the United Nations University-International Institute for Global Health (UNU-IIGH) and the Pharmaceutical Services Division of the Ministry of Health, as co-organisers of this significant event, for their invaluable contribution towards the success of this conference as well as their endeavour to promote pharmacoeconomic research.

Healthcare delivery systems all around the world are faced with the perennial problem of rising costs and thus, efforts are being made to enhance efficiency. In this cost-conscious era, pharmacoeconomic research has evolved to become a significant field of research and clearly has an important role to play. Pharmacoeconomic evaluation identifies measures and compares the costs and benefits of pharmaceutical products and services in order to make rational therapeutic choices, thus enhancing efficiency.

The theme of this conference, “Pharmacoeconomics in Healthcare Transformation: Towards Universal Coverage”, reflects our noble goal of achieving universal health coverage in Malaysia, which I am pleased to say, we are well on the road to achieving. I am also pleased that this conference will bring together local experts as well as experts from abroad to exchange ideas and learn from one another, with the noble aim of ensuring that our patients, who are after all the centre of the healthcare Universe, will ultimately benefit from our concerted efforts. We are after all, a nation working together for our patients, who are after all the centre of the healthcare Universe, will ultimately benefit from our concerted efforts. We are after all, a nation working together for

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WELCOME MESSAGE FROM FOUNDING PRESIDENT, MYSPOR

I gives me great pleasure to welcome all participants to this Second Pharmacoeconomics and Outcome Research Conference 2014. We have chosen the theme this year as “Pharmacoeconomics in Healthcare Transformation: Towards Universal Coverage”. Our focus on universal coverage is in-line with the efforts made by many developing countries in the world today in re-shaping their health care systems to extend health services to cover all sectors of the population. Researchers in the field of pharmacoeconomics will have the opportunity to deliberate on how we can contribute to assist policy makers in these countries to stretch scarce resources to achieve this noble goal. Continuing increase in cost of drugs and medical equipment posed major challenges for developing countries to meet healthcare needs and demand of the growing population. MYSPOR, since its inception five years ago, set our mission to promote research and development in pharmacoeconomics. We are confident that the outcome of these studies will be utilised by decision makers in providing sustainable solution to current issues affecting our nation’s health system. MYSPOR is also established to serve as a platform for those interested in pharmacoeconomics to sharpen their skills and knowledge in this discipline.

On behalf of MYSPOR, I would like to thank Ministry of Health Malaysia and United Nations University International Institute for Global Health (UNU-IIGH) for providing the support to co-organize this Conference. Our sponsors from the industries have given us great help to enable us to bring in speakers especially from outside Malaysia.

I would like to thank members of the organizing committee who has been working diligently to prepare the programme and bring in experts from various part of the world to this conference even though they are working with the constraints of time and finance. I would like to acknowledge all our advisors who have given us valuable input to improve the organization as well as the content of the conference programme.

Finally, it is my sincere hope that you will have an enjoyable as well as fruitful time in the next three days and I look forward to meeting all of you in this Conference.

FOREWORD FROM THE HONOURABLE MINISTER OF HEALTH, MALAYSIA

Takes this opportunity to thank all the sponsors of the conference for their generosity and support. Finally, I would also like to thank all my fellow organizing committee members, as well as all the volunteers for their hard work. With that, I wish you all a great conference!
2nd PHARMACOECONOMICS AND OUTCOME RESEARCH CONFERENCE 2014
“Pharmacoeconomics in Healthcare Transformation: Towards Universal Coverage”

THE ROYALE CHULAN, KUALA LUMPUR, MALAYSIA • 7-9 MARCH 2014

7 MARCH, FRIDAY

09:00-12:00pm MORNING SHORT COURSE
- WORKSHOP 1: INTRODUCTION TO PHARMACOECONOMICS AND CRITICAL APPRAISAL OF ECONOMIC EVALUATION • Professor Samsinah Haji Hussain, University Malaysia; Dr Ramli Zainal, Institute of Health Systems Research
- WORKSHOP 2: CONDUCTING PHARMA-EPIDEMIOLOGY RESEARCH • Professor Li Shu Chuen, University of Newcastle, Australia

14:30-17:30pm AFTERNOON SHORT COURSE
- WORKSHOP 3: ACTIVITY-BASED COSTING • Professor Dato' Syed Mohamed Aljunid, UNU-IIGH; Dr Amrizal Muhammad Nur, Dr Zafar Ahmed, IITC
- WORKSHOP 4: QIOL INSTRUMENTS AND CALCULATION OF UTILITY VALUES • Adrian Goh, Azmi Burhani Consulting; Assoc. Professor Asrul Akmal Shafie, Universiti Sains Malaysia

8 MARCH, SATURDAY

08:15-09:45am KEYNOTE & LAUNCH
- KEYNOTE ADDRESS • Dato' Dr Noor Isham Abdullah, Director-General, Ministry of Health, Malaysia
- CONFERENCE LAUNCH: WELCOME ADDRESS • Professor Dato' Syed Mohamed Aljunid, MySPOR President
- OPENING SPEECH & CONFERENCE LAUNCH • Y.B. Dato' Seri Dr S. Subramanian, Minister of Health, Malaysia

09:45-10:30am BREAK, EXHIBITS & POSTERS

10:30-11:00am EDUCATIONAL WORKSHOP
- PHARMACOECONOMICS 101: DEMYSTIFYING PHARMACOECONOMIC TERMINOLOGY • Adrian Goh, Azmi Burhani Consulting

11:00-12:30am PANEL 1
- PHARMACOECONOMICS IN DECISION-MAKING – SHARING REGIONAL EXPERIENCES
  • AUSTRALIAN EXPERIENCE • Professor Li Shu Chuen, Newcastle University, Australia
  • THAILAND EXPERIENCE • Professor Nathorn Chaiyakunapruk, Sunway Monash University, Malaysia
  • TAIWAN EXPERIENCE • Dr Jasmine Pwu, Director of HTA, Center for Drug Evaluation, Taiwan

12:30-13:30pm LUNCH Symposium
- UNIVERSAL COVERAGE: PHARMACOECONOMICS AND PATIENTS ACCESS ISSUES AND CHALLENGES • Mendel Grobler, Pfizer

13:30-14:00pm BREAK, EXHIBITS & POSTERS

14:00-15:45pm PANEL 2
- PHARMACOECONOMICS IN HEALTHCARE TRANSFORMATION
  • ROLE OF PHARMACOECONOMICS IN MOH DECISION MAKING • Anis Talib, Ministry of Health, Malaysia
  • THE FUTURE OF HEALTH INFORMATION SYSTEMS – POTENTIAL USE FOR OBSERVATIONAL RESEARCH • Dr Md Khadzir Sheikh Ahmad, Ministry of Health, Malaysia
  • HTA IN MALAYSIA MOVING FORWARD • Noormar Darus, Ministry of Health, Malaysia

15:45-16:00pm BREAK, EXHIBITS & POSTERS

16:00-17:30pm PANEL 3
- BRIDGING SCIENCE TO POLICY WITH PHARMACOECONOMICS
  • INTRODUCTION TO THE CE THRESHOLD • Assoc. Professor Sharifa Ezat Wan Puthe, Universiti Kebangsaan Malaysia
  • DO WE NEED A THRESHOLD FOR MALAYSIA? • Assoc. Professor Asrul Akmal Shafie, Universiti Sains Malaysia
  • VALUE-BASED PRICING • Professor Kenneth Lee, Sunway Monash University, Malaysia
  • MULTI-CRITERIA DECISION ANALYSIS (MCDA) AND OTHER NEW IDEAS • Dr Soraya Azmi, Azmi Burhani Consulting

9 MARCH, SUNDAY

08:00-09:00am EDUCATIONAL WORKSHOP
- PHARMACOECONOMICS 102: INTERPRETING RESULTS: COST, OUTCOME, ICERS • Dr Soraya Azmi & Dr Goh Bak Leong

09:00-10:45am PANEL 4
- COST-EFFECTIVENESS vs. COST-REDUCTION: THE BALANCE BETWEEN ACCESSIBILITY, AFFORDABILITY AND AVAILABILITY
  • COST-EFFECTIVENESS VS. COST REDUCTION – AN AUSTRALIAN CASE STUDY • Professor Li Shu Chuen, Newcastle University, Australia
  • COST-EFFECTIVENESS OF TREATING TO TARGETS WITH BIOLOGICS IN MIDIS • Dr. Carol Bao, AbbVie, USA
  • THE CHALLENGE FOR PUBLIC HEALTH: PROVIDING UNIVERAL COVERAGE AND COST-EFFECTIVE TREATMENT • Dr. Feisul Idzwan Mustapha, Ministry of Health, Malaysia

10:45-11:00am BREAK, EXHIBITS & POSTERS

11:00-12:20pm PANEL 5
- PHARMACOECONOMICS RESEARCH – ARE WE READY FOR IT?
  • WHAT ARE THE COMPONENTS NEEDED TO CONDUCT PHARMACOECONOMICS RESEARCH? Adrian Goh, Azmi Burhani Consulting
  • DATA AVAILABILITY FOR PHARMACOECONOMICS RESEARCH • Professor Dato' Syed Mohamed Aljunid, United Nations University
  • HOW TAIWAN BUILT CAPACITY TO CONDUCT HTA ASSESSMENTS • Dr Jasmine Pwu, Director of HTA, Center for Drug Evaluation, Taiwan
  • PHARMACOECONOMICS AS A TOOL FOR EVIDENCE-BASED MEDICINE • Dr. Sunila Bavanandan, Nephrologist, Hospital Kuala Lumpur

12:20-13:20PM LUNCH SYMPOSIUM
- HEALTH TECHNOLOGY APPROACHES AND FIT FOR PURPOSE IN DEVELOPING HEALTH CARE SYSTEMS • Christoph Glaetzer, Janssen

13:20-13:50pm BREAK, EXHIBITS & POSTERS

13:50-14:50pm RESEARCH PODIUM PRESENTATION
- Track 1: Quality of Life
- Track 2: Cost & Cost effectiveness
- Track 3: Pharmacoeconomics, health services research, utilisation and policy

14:50-16:25pm PANEL 6
- PHARMACOECONOMICS AND HEALTHCARE TRANSFORMATION–COLLABORATIONS FOR THE FUTURE
  • STRENGTHENING DECISION-MAKING THROUGH COLLABORATIVE EFFORT • Dr Samah Bahri, Ministry of Health Malaysia
  • INDUSTRY’S ROLE – JOINING TOGETHER TO STRENGTHEN PHARMACOECONOMICS RESEARCH IN MALAYSIA • Yew Wei Tang, President of PHAMA
  • A PEEK INTO THE FUTURE MALAYSIAN HEALTHCARE LANDSCAPE • Datuk Dr. Jeyandran Tan Sri Sinnadurai, Deputy Director-General (Medical), Ministry of Health, Malaysia

16:25-16:50 PRIZES & RECOGNITION
- PRIZES PRESENTATION – PODIUM & POSTER

16:50-17:00pm CLOSING REMARKS
- Professor Dato Syed Mohamed Aljunid, MySPOR President

17:00pm TEA & END

17:00 - 18:00pm AGM MySPOR
WORKSHOP 1

**PRINCIPLES OF PHARMACOECONOMICS AND CRITICAL APPRAISAL OF ECONOMIC ANALYSIS**

**Date/Time:** FRIDAY, 7 MARCH 2014  
9.00am to 12.15pm

**Speakers:**  
Professor Samsinah Haji Hussain, Universiti of Malaysia  
Dr. Ramli Zainal, Institute for Health Systems Research

The workshop is aimed to describe the fundamental principles of economic evaluation and provide an introduction to its interpretation. Different pharmaco-economic analysis will be shared including Cost Minimisation Analysis, Cost Effectiveness Analysis, Cost Utility Analysis and Cost Benefit Analysis. The workshop will also provide tutorial of an appraisal of a published economic evaluation study based on the fundamental principles using the Drummond 10-point checklist.

WORKSHOP 2

**CONDUCTING PHARMACOEPIDEMIOLOGIC RESEARCH**

**Date/Time:** FRIDAY, 7 MARCH 2014  
9.00am to 12.15pm

**Speaker:**  
Professor Li Shu Chuen, University of Newcastle, Australia

The workshop will provide a brief summary of the types of pharmacoepidemiologic research being conducted and their usefulness to public health as well as to decision makers. The workshop will start with a short introduction of some of the basic epidemiologic and other concepts used in conducting pharmacoepidemiologic studies. This will be followed by hands-on exercises on drug utilization review and pharmacoeconomic evaluation.

WORKSHOP 3

**ACTIVITY-BASED COSTING**

**Date/Time:** FRIDAY, 7 MARCH 2014  
2.30pm to 5.30pm

**Speakers:**  
Prof. Dato’ Dr. Syed Mohamed Aljunid, United Nations University-International Institute for Global Health  
Dr. Amrizal Muhammad Nur, International Training Centre for Casemix and Clinical Coding  
Dr. Zafar Ahmed, International Training Centre for Casemix and Clinical Coding

Activity based costing is one of the costing methods used in Case-Mix system. It can be defined as an accounting method that enables the organization to determine the true costs related with their service based on the resources that are consumed. This workshop is suitable for those who involved in hospital management, hospital budget planning, and hospital information management. This workshop will include a practical session.

WORKSHOP 4

**USING QUESTIONNAIRES TO MEASURE QUALITY OF LIFE**

**Date/Time:** FRIDAY, 7 MARCH 2014  
2.30pm to 5.30pm

**Speakers:**  
Adrian Goh, Azmi Burhani Consulting  
Assoc. Professor Asrul Akmal Shafie, Universiti Sains Malaysia

This workshop will introduce the concepts of Quality of Life (QOL) and health utility, and their measurement using Patient Reported Outcome (PRO) instruments. The workshop will describe the selection of appropriate PRO instruments and the use of PRO data to quantify QOL and health utility. The workshop will include a practical session. Participants will be required to bring a laptop installed with Microsoft Excel, version Excel 97 or later.
PHARMACOECONOMICS IN DECISION-MAKING – SHARING REGIONAL EXPERIENCES: EXPERIENCE FROM AUSTRALIA
Professor Shu Chuen Li, Newcastle University, Australia

The presentation will provide a brief history of the development of using pharmacoeconomics in decision making in Australia, the first country to require supplying economic data from pharmaceutical companies as mandatory requirement for drug reimbursement applications. The rationale for the introduction of such requirement is discussed and the impact as observed from different stakeholders with the introduction of pharmacoeconomic evaluation in decision-making will be evaluated. Finally the long-term effectiveness of such approach in reimbursement decision making is discussed.

HEALTH ECONOMICS IN DECISION-MAKING – SHARING THAILAND EXPERIENCES
Professor Chaiyakunapruk, Sunway Monash University, Malaysia

Health economics data become an important piece of information used during decision making in Thailand. National List of Essential Medicine under the Health Technology Assessment (HTA) in Thailand requires health economic data for some pharmaceutical products. It is recommended to include health economics data during the dossier submission. National Health Security office, the largest payer for more than 75% of Thai population, has commissioned research organizations to conduct health technology assessment (including health economics) of interventions including diagnostics, pharmaceuticals, and programs. The findings are used to assist policy decision makers to consider whether the interventions will be included in their health benefit package. Health economics data are mostly based on local data, HTA need to be provided to decision makers in a timely fashion. Key facilitators for having health economics data used for decision making in Thailand are the followings: 1) Thai health technology assessment guideline 2) repository of health economics database in Thailand 3) Thai costing menu (including unit cost for most medical care services and average values for direct non-medical and indirect cost) and 4) the strong interest of policy makers in using such data as part of their decision making process.

PHARMACOECONOMICS IN DECISION-MAKING – SHARING REGIONAL EXPERIENCES (TAIWAN EXPERIENCE)
Dr. Jasmine Raoh-Fang Pwu, Centre for Drug Evaluation, Taiwan

The reimbursement and listing mechanism of National Health Insurance adopted that of the earlier Labor/Government Employee Insurances era, and it has been gradually modified into the current system. Unlike most other countries, the system allows National Health Insurance Administration (NHIA) to set reimbursement prices based on the clinical value. Budget impact is weighted more in the decision making process, especially in the second-generation NHI era. However a price mark-up design (up to 10% if meets good quality local cost-effectiveness analysis criteria) has been introduced and it encouraged the development of the local capacity to conduct proper cost-effectiveness analysis. The following effects are observed: the willingness to invest on local studies (epidemiologic distribution, treatment patterns, cost analysis, and modelling), more acceptances on the concept of incremental cost-effectiveness ratio (ICER) or cost-effectiveness from all parties.

THE FUTURE OF HEALTH INFORMATION SYSTEM – POTENTIAL USE FOR OBSERVATIONAL RESEARCH
Dr Md Khadzir Bin Sheikh Hj Ahmad, Ministry of Health, Malaysia

Health Information System gathers encounters of patient at any healthcare facilities. The system of collection is migrating from manual to electronic form from collecting aggregated to granular data. The direction is to move into Health Data Warehouse that is a trusted source of information, which meet the diverse needs of timely health information provision and management, and acts as a platform for the standardization and integration of health data from a variety of sources. This can be leveraged to better manage the health system, provide surveillance information and in addition provides a valuable source of data for research. The data collected opens up to various cross sectional studies of a patient encounter across various spectrums of illnesses or services. Among others is the potential to link data marts such as a study of stroke patient attending outpatient department to being admitted as in patient and later being followed up by physiotherapist or speech therapist. Study can also be conducted in time series since the data are census and dynamic in nature. As the system mature and with more data marts linked more potential use can be demonstrated especially in the area of monitoring Key Performance Indexes. HTA in Malaysia, Past and Present

HTA IN MALAYSIA MOVING FORWARD
Noormah Mohd Darus, Ministry of Health, Malaysia

Health Technology Assessment (HTA) is a multi-disciplinary activity which systematically examines the safety, clinical efficacy, effectiveness, cost, cost-effectiveness, organizational implications, social consequences, legal and ethical considerations of the application of a health technology usually a drug, medical device or clinical/surgical procedure. HTA broadly focuses on two questions: Clinical effectiveness – how do the health outcomes of the technology compare with available treatment alternatives; cost-effectiveness – are these improvements in health outcomes commensurate with the additional costs of the technology? HTA acts as ‘a bridge’ between evidence and policy-making. The Health Technology Assessment (HTA) Unit was set up in Malaysia in August 1995 in the Ministry of Health Malaysia and has since grown tremendously in size and resources. To date, fifty-six in-depth assessments have been carried out, and the recommendations of these assessments for some pharmaceutical products have been subsequently implemented. In addition, approximately 232 rapid assessment reports were produced in response to requests from mainly governmental policy and decision makers. HTA has been able to provide input into formulation of national and Ministry of Health Malaysia policies such as purchasing decisions. HTA also provides a basis for clinical practice guidelines development (seventy-five CPG’s produced till date), control of drugs as well as non-drugs and medical devices, matters pertaining to regulation of medical practices, as well as advertisements related to health. In Malaysia, a major challenge is sustainability of the program, to be able to have competent trained personnel, a need to have constant efforts to create awareness on the utilities of HTA so that its full potential can be realized. The scope of services may also need to be expanded to include an early warning system such as the horizon scanning. Malaysia has successfully implemented a health technology program that has had some major impact (to a certain extent) on policy formulation and decision making at various levels in government and private health care delivery systems.

INTRODUCTION TO THE CE THRESHOLD
Associate Professor Dr Shariffa Ezat Wan Puteh

Cost effectiveness analysis (CEA) studies have gained momentum and regarded as one of the most important step, assisting countries and national health programs around the world in determining the most acceptable cost effective strategy. CEA studies are needed beside data on intended interventions’ efficacy, effectiveness and safety. The CEA thus looks at the ICER (Incremental cost effectiveness ratio) i.e. the ratio of difference in cost over the differences
in outcomes between different strategies; may it be drugs, vaccinations, programs or medical technologies. One of the most common ICER used nowadays is QALY (quality adjusted life years) saved/gained between intended interventions. This threshold level is then compared between different threshold values, such as GDP per capita of the country as advocated by WHO or proposed levels proposed by different related organizations. The presentation will outline a few accepted methods of ICER threshold determinations, its strengths and drawbacks.

DO WE NEED A THRESHOLD IN MALAYSIA?

Associate Professor Azril Akmal Shafie, Universiti Sains Malaysia

In contrast to other economic discipline, health economics usually employs cost-utility analysis in evaluation of alternatives. However, most new treatments are characterized more expensive but also more effective. This requires external criterion in deciding its cost-effectiveness outside the net monetary benefit framework. The criterion, also called threshold was traditionally set at arbitrary value based on unknown origin or GDP per capita per disability-adjusted life year (DALY). There is a recent drive to seek empirical value of the threshold through monetary valuation of health. Although such empirical efforts can be traced back to other non-health economic studies in estimating value-of-a statistical-life (VSL), many health economists argued that the value should somehow reflect the preferences of the population which is affected by them both as potential recipients of medical services (patients) and as payers of taxes or social insurance contributions. Gains (or avoidance of losses) in (more) healthy lifetime are the typical target of health care and thus empirical value based on preference is of greater relevance in the economics of health care. This presentation would first introduce the rational and application of the threshold in economic evaluation. This is followed by overview of the theoretical framework as well as the strengths and shortfalls of the previous attempts made in Asia and Europe. Finally, the conceptual framework, tools, plans, and preliminary results of a current survey in Japan, Korea, Malaysia, and Thailand the threshold value and potential in Malaysia will be discussed.

VALUE-BASED PRICING

Professor Kenneth KC Lee, Sunway Monash University, Malaysia

Health care spending is increasingly a global issue especially in those high spending areas such as oncology, rheumatology and gastroenterology due to the introduction of many new innovative medicines. Many authorities have therefore implemented various measures to ensure expenditures are contained or if money has to be spent, it is spent in the most cost-effective manner. The concept of the "value" of a medicine has increasingly replaced the traditional parameters of "efficacy", "safety" and "cost" in assessing a new therapeutic agent. Value is now measured as "the health outcomes achieved per dollar spent" to ensure every dollar spent on health care is based on sound evidence and further as a result, achieve a maximum return and a most favourable outcome. One is to reflect that new pricing strategies based on the value of a medicine will bring about a paradigm shift in the health care arena by becoming the corner stone for price determination in many jurisdictions. They are however relatively new concepts in most parts of Asia. It is hoped that the 20min presentation on "Value-based pricing" would throw some light to the future direction in health care financing in this part of the world.

MULTI-CRITERIA DECISION ANALYSIS (MCDA) AND OTHER NEW IDEAS

Dr. Soraya Azmi, Azmi Burhani Consulting

Although the use of pharmacoeconomics and outcomes research as part of the formal decision making process is still evolving and new to Malaysia, this field has been around for many years beginning since the 1990s. The sub-categories of research that make up the field are many; ranging from patient reported outcomes (PROs) to decision analysis and modelling to cost-effectiveness and cost-utility analysis. Challenges faced by researchers and decision-makers constantly push the research boundaries to expand to greater breadth and depth with new thinking being applied. Internationally, among the newer issues and methods being discussed are personalized medicine and network meta-analysis, how to measure PRO in children and the use of electronic PRO instruments. One of the interesting recent debates has been about the use of multi-criteria decision analysis (MCDA), which aims to move the conversation beyond cost-effectiveness analysis and incremental cost-effectiveness ratios (ICERs), to include other concerns decision-makers may have. This is an example of how this field of research is being used to further improve the ability to make informed and transparent decisions. The debate also illustrates that one size may not fit all.

COST EFFECTIVENESS VS. COST REDUCTION: AN AUSTRALIAN CASE STUDY

Professor Sha Chuen Li, Newcastle University, Australia

The presentation will discuss the theoretical argument as whether the implementation of economic evaluation is a strategy to promote cost-effectiveness in health care delivery or a cost reduction measure in disguise. The presentation will examine the process of applying economic evaluation in drug reimbursement decision making and various methods used to promote cost-effective use of drug listed in the Pharmaceutical Benefits Scheme. Finally, a case of how incremental cost-effectiveness ratio can be used to negotiate a reduced acquisition price for a pharmaceutical product for the Pharmaceutical Benefits Scheme is presented.

COST EFFECTIVENESS OF TREATING TO TARGETS WITH BIOLOGICS IN IMIDS

Dr. Carol Bao, AbbVie, USA

Treat To Target, or T2T, is an international initiative to define RA treatment targets and recommendations to measure disease severity and encourage earlier diagnosis and optimize treatment. While this guidance is gaining acceptance in clinical practice, the economic implications of such practice remain to be fully explored. In this presentation the cost-effectiveness of various T2 strategies for achieving and maintaining remission among early RA patients is evaluated from German perspective. The treatment strategies are: (A) first-line adalimumab (ADA) + methotrexate (MTX); (B) first-line MTX monotherapy, followed by a hybrid approach with ADA + MTX for patients with high disease activity and one DMARD + MTX for patients with low or moderate disease activity after MTX failure; and (C) current German treatment sequence: ADA + MTX after 2 conventional DMARDs. Both direct and indirect costs are assessed and utility is mapped based on disease severity measured by the Disease Activity Score (DAS) 28. The assessment shows strategies A and B to be cost effective compared with the current German sequence and the indirect costs savings are found to be critical in achieving cost effectiveness with the threshold level.

THE CHALLENGE FOR PUBLIC HEALTH: PROVIDING UNIVERSAL COVERAGE AND COST-EFFECTIVE TREATMENT

Dr. Faisal Izwan Mustapha, Ministry of Health, Malaysia

The prevalence of non-communicable diseases (NCDs) and NCD risk factors in Malaysia have risen substantially in the last two decades. This has resulted in significant pressure to the public health systems in providing appropriate and quality care to patients partly due to the shift from an acute care model to a more chronic care model as well as the existing separation of the public and private healthcare services in Malaysia. No country in the world has the answer on how best to provide universal coverage and cost effective treatment especially for NCDs. Even with the best treatment available, patients and their families play a major role in determining how well their disease is controlled and thus reducing the risk of complications and premature deaths. There is now a global monitoring framework for the prevention and control of NCDs with 25 indicators and 9 voluntary global targets which forms part of the Global Action Plan for the Prevention and Control of NCDs, adopted at the 66th World Health Assembly in May 2013. The World Health Organization has provided a menu of cost effective interventions and universal health coverage is pivotal in this endeavour.

WHAT ARE THE COMPONENTS NEEDED TO CONDUCT PHARMACOECONOMICS RESEARCH?

Adrian Goh, Azmi Burhani Consulting

This presentation will describe the types of resources required to perform pharmacoeconomic analyses. It will touch upon the importance of the availability of local data and briefly discuss the options available to researchers in situations where such data is not readily available.
DATA AVAILABILITY FOR PHARMAECOENOMICS RESEARCH
Professor Dato’ Dr Syed Mohamed Aljunid

A ll research agendas including pharmaco经济学 turn data from various sources into valuable information for decision-making. While the important of timely, accurate and reliable data is an important asset of any health system, getting access into such data is a major problem in developing countries. Pharmacoconomics research requires at least two types of data: costing data on certain interventions and outcome data to reflect effectiveness of such interventions. There a number of important reasons why these two sets of data are very scarce in less developed countries. Firstly, most health systems of developing countries do not invest enough resources to collate routinely data on cost and outcome. Secondly, lack of trained personnel with adequate knowledge and skill to plan and implement health management information system where data can be systematically collected. Thirdly, there is inadequate policy to support the concept of data sharing among major players in research and development. Academic staff in universities and higher learning institutions that have the technical capacity to use these data many a times faced bureaucratic obstacles to access data generated in government agencies even though the data was collected using fund from tax payers. It might also be true that sometimes certain data and information was protected from public access to cover-up corrupt practice, unprofessional conduct and provision of substandard care. Systematic transformation of the national health system is required if we are serious in encouraging the use of evidence to support decision-making. For the start, health policy makers in developing countries should embark on an open-door policy to facilitate data sharing among researchers in different sectors.

HOW TAIWAN BUILT CAPACITY TO CONDUCT HTA ASSESSMENTS
Dr. Jasmine Rashi-Fang Poo, Centre for Drug Evaluation, Taiwan

C apacity building is one of the most important issues when building up a Health Technology Assessment (HTA) system. Capacity in this area may be categorized into: clinical effectiveness assessors, economic (include utilization) assessors, system impact assessors, other ethical/legal/social impact (ELSI) experts, and who understands the HTA concept and help integrate the concept into decision-making mechanism. Each function requires variety of training, e.g., basic HTA concepts, basic statistical knowledge, epidemiology, statistics, clinical medicine, economics, etc). State-of-the-art assessment methodology (systematic review, meta-analysis, modelling studies, etc.), and ELSI courses. There are no Master or PhD degrees designed for HTA workers in Taiwan’s universities, although specific courses can be found. Under these circumstances, we have made today by exploring the following routes: a) attend the decision making meetings whenever possible; b) identify the necessary core abilities and locate and invite proper trainers to provide courses; c) study the advanced HTA agency reports, especially their integration with decision making processes; d) hold workshops/symposium to promote HTA and hear from all parties.

THE RELEVANCE OF HEALTH ECONOMICS AND OUTCOMES IN CLINICAL PRACTICE
Dr. Sunita Bavanandan, Ministry of Health, Malaysia

T he increasing influence of Evidence-based Medicine and Health Technology Assessment in policy-makers’ decisions, clinical practice guidelines, and local management decisions may sometimes lead to the misperception that clinicians have lost their clinical freedom and play a secondary role in therapeutic decision-making. However, there is a need to reconcile the doctor’s duty of responsibility to the individual patient to provide the most effective or best available alternative, regardless of cost, with the same doctor’s population-health ethic of efficiency, based on providing the population with the best option according to limited available resources. This lecture will use examples taken from literature on diabetes, hyperlipidemia and chronic kidney disease to explore how clinicians may use the results of economic evaluations in their daily clinical practice, making decisions about cost-effectiveness on a case-by-case basis, and addressing both the patient’s and society’s needs. Through these examples, we can see the relevance of Health Economics in clinical practice

1. to help prioritize interventions
2. to identify target sub-populations for whom technology may be particularly cost-effective, thus facilitating individualised therapy
3. to identify factors with great impact on cost-effectiveness results - these can then be modified by clinicians for more efficient use of resources.

HEALTH TECHNOLOGY APPROACHES AND FIT FOR PURPOSE IN DEVELOPING HEALTH CARE SYSTEMS
Christoph Glaetzer, Janssen

T he use of concept of health economics (HE) and Health technology assessments (HTA) to determine the value of treatment has been a cornerstone in coverage decisions in many countries with reimbursed healthcare system. There are two main approaches in these, the use of clinical effectiveness as primary decision criterion and/or the use of cost effectiveness implemented to address specific question in the respective market. Both are aimed to improve system efficiency and health outcomes as a whole under the umbrella of healthcare coverage. They represent however two different “schools of thought” that are different in methodology and the role in assisting decision making and therefore sometimes leading to similar and sometimes to different outcomes on coverage decisions. To adopt either approach in countries where the healthcare coverage is under development needs all-inclusive consideration for factors shown below. To understand the areas intended outcome to be improved and achieved is crucial before considering any model. Different approaches will provide different outcomes thus it must be “fit for purpose”. Requirement in evidence and technical expertise for any model needs to be considered to be “feasible and customary” in a country contextual environment. The talk will briefly recapture the main aspects and differences of both models and highlight the relevant aspects and considerations in evaluating usefulness in emerging healthcare systems.

INDUSTRY’S ROLE - JOINING TOGETHER TO STRENGTHEN PHARMAECOENOMICS RESEARCH IN MALAYSIA
Yew Wei Tarng, PHAMA, Malaysia

T he Healthcare landscape is rapidly changing and is moving in the direction of One Healthcare where access to innovative medicine plays a key role. It is a key strategic component in our National Medicine Policy (DUNas). We agree strongly on the need to promote use of HTA in national frameworks and strengthening PE research. We can collaborate with all relevant stakeholders to ensure we provide technical assistance, technology and knowledge transfers. The increase in demand and cost, coupled with scarcity in resources are key barriers. We need to develop our capability and capacity to ensure we are able to generate local data. Herein lays the opportunity for us to work together and through better policy framework and guidelines we are able to develop a basic HTA system for research. At the moment, the industry has been providing strong supports in Clinical Research and we need to take a step further to align this well with the policy framework and also provide incentives. Finally we need to develop a clear roadmap together with strong collaboration from all stakeholders and sponsors from the government. Our goal is to ensure that we could provide access of innovative medicines to the patients and ensure best patient care and outcomes.
# LIST OF ABSTRACT

## PODIUM PRESENTATIONS

### Quality of Life

<table>
<thead>
<tr>
<th>Abstracts #</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Bring Back Medication: A Study of Patients’ Awareness, Cost Saved and Storage Practice in Selayang Hospital.</td>
</tr>
<tr>
<td>7</td>
<td>Clinical Impact of Empirical Antifungal Therapy on the Survival from Infection in Chemotherapy-Induced Febrile Neutropaenic Adult Patients.</td>
</tr>
<tr>
<td>21</td>
<td>Incidence and Causality in Adverse Drug Reaction-Related Admission to Hospital: A Systematic Review.</td>
</tr>
<tr>
<td>27</td>
<td>Perception, Acceptance and Tolerability of Patients Taking Innovator versus Generic Escitalopram.</td>
</tr>
<tr>
<td>29</td>
<td>Study on the Clinical Outcome of Pharmacist-Managed Diabetes Patients.</td>
</tr>
<tr>
<td>57</td>
<td>Health-Related Quality of Life (HRQoL) in Type 2 Diabetes Mellitus: A Study in Selangor District Hospitals.</td>
</tr>
</tbody>
</table>

### Cost and Cost-effectiveness

<table>
<thead>
<tr>
<th>Abstracts #</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Cost-Effectiveness of Warfarin Medication Therapy Adherence Clinic (WMTAC) Compared to Usual Medical Clinic (UMC) in Kuala Lumpur Hospital.</td>
</tr>
<tr>
<td>12</td>
<td>Cost-Effectiveness of Insulin Glargine for Type 2 Diabetes Mellitus.</td>
</tr>
<tr>
<td>13</td>
<td>Pilot Evaluation of Two Childhood Obesity Prevention Programs in Malaysia.</td>
</tr>
<tr>
<td>35</td>
<td>Cost Analysis of the Extemporaneous Preparation of Folic Acid 1mg/mL Syrup in Sungai Buloh Hospital Out Patient Pharmacy Department with the Use of either Simple Syrup or X-Temp Suspension as a Suspension Vehicle.</td>
</tr>
<tr>
<td>53</td>
<td>Exploring the Willingness to Pay for Voluntary Community-Based Health Insurance in Malaysia.</td>
</tr>
<tr>
<td>70</td>
<td>Measuring Childhood Obesity Based on Three Different Approaches: WHO, CDC and IOTF Criteria.</td>
</tr>
</tbody>
</table>

### Pharmacoepidemiology, Health Services Research, Healthcare Utilization and Policy

<table>
<thead>
<tr>
<th>Abstracts #</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Glycaemic Control of Diabetic Patients in Pharmacist-Managed Telephonic Insulin Titration.</td>
</tr>
<tr>
<td>19</td>
<td>Antibiotic Use, Expenditure and Outcomes at Kajang Hospital: The Impact of Antibiotic-Medifact Program.</td>
</tr>
<tr>
<td>61</td>
<td>Medication Reconciliation in Hospital Banting Medical Wards: Identifying the Types and Factors Contributing to Medication Discrepancies.</td>
</tr>
<tr>
<td>63</td>
<td>An Audit of the Diabetes Medication Therapy Adherence Clinic (DMTAC) in Serdang Hospital.</td>
</tr>
<tr>
<td>66</td>
<td>Potential Drug-Drug Interaction among Elderly Admitted to Medical Wards of Serdang Hospital: A Prospective Study.</td>
</tr>
</tbody>
</table>

## POSTER PRESENTATIONS

### Pharmacoepidemiology

<table>
<thead>
<tr>
<th>Abstracts #</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Incidence of Adverse Effects due to Fluorouracil, Epirubicin and Cyclophosphamide (FEC) Chemotherapy in Breast Cancer Patients at Hospital Tengku Ampuan Rahimah (HTAR), Klang.</td>
</tr>
<tr>
<td>16</td>
<td>Evaluating the Prescribing Dosing Trends of Opioid Substitution Treatment Programme in Private Medical Practitioner Clinics by Calculating the Estimated Average Daily Dose (EADD) of Methadone and Buprenorphine After the Implementation of Psychotropic Permit in Malaysia.</td>
</tr>
<tr>
<td>22</td>
<td>Economic Evaluation of Food Water Borne Disease in Malaysia.</td>
</tr>
<tr>
<td>24</td>
<td>Overview of the Sampling Pattern of Suspected Paracetamol (PCM) Poisoning In Hospital Sungai Buloh (HSB).</td>
</tr>
<tr>
<td>28</td>
<td>Patient’s Own Drugs: Profile of Drugs Cost and Wastage</td>
</tr>
<tr>
<td>30</td>
<td>Usage of IV NAC in ICU Patient with Renal Insufficiency to Prevent Contrast-Induced Nephropathy.</td>
</tr>
<tr>
<td>32</td>
<td>Correlation of Phenytoin Level with Rhabdomyolysis and Thrombocytopenia in Critically Ill Patients with Hypoalbuminaemia.</td>
</tr>
<tr>
<td>34</td>
<td>Pending Authorization in Outpatient Pharmacy of Hospital Sungai Buloh.</td>
</tr>
<tr>
<td>38</td>
<td>Prescribing Pattern of Broad-Spectrum Antibiotics in the Medical Wards of Hospital Sungai Buloh.</td>
</tr>
<tr>
<td>48</td>
<td>Outcome Status and Duration of Dual Antiplatelet Use Among Post-PCI Patients.</td>
</tr>
<tr>
<td>49</td>
<td>Length of Stay and Prognostic Factors for 30-day Readmission for Post-PCI Patients with Dyslipidaemia, Hypertension and Diabetes.</td>
</tr>
<tr>
<td>55</td>
<td>A Study on Drug Information Utilization and Accessibility at Kajang Hospital.</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>65</td>
<td>A Study of Patient’s Satisfaction &amp; Adherence to Ministry of Health Malaysia (MOH) Guidelines on Dispensing Methadone in Agensi Anti Dadah Kebangsaan (AADK) Hulu Langat, Selangor.</td>
</tr>
<tr>
<td>71</td>
<td>To Evaluate the Effectiveness of Medication Therapy Adherence Clinic (MTAC) in Psoriasis Patients in Selayang Hospital.</td>
</tr>
<tr>
<td>73</td>
<td>A Retrospective Analysis of Medication Possession Ratio in Predicting Virologic Outcomes among HIV Infected Adults on Second Line Antiretroviral Therapy in Sungai Buloh Hospital (HSB).</td>
</tr>
</tbody>
</table>

**Quality of Life**

<table>
<thead>
<tr>
<th>4</th>
<th>A Study of Cephalosporin Use in Female Medical Ward in Hospital Banting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Unauthorized Prescription in Outpatient Pharmacy Hospital Ampang.</td>
</tr>
<tr>
<td>15</td>
<td>Determination of Cost-Effectiveness Threshold for Malaysia.</td>
</tr>
<tr>
<td>17</td>
<td>Economic Evaluation of Enhanced Asthma Management: A Systematic Review.</td>
</tr>
<tr>
<td>18</td>
<td>Health-Related Quality of Life (HRQOL) among Mothers with Thalassemia Children in Malaysia.</td>
</tr>
<tr>
<td>20</td>
<td>Drug Utilization and Cost of Antipsychotic in the Treatment of Schizophrenia at Kajang Hospital.</td>
</tr>
<tr>
<td>23</td>
<td>Economic Evaluation of Zoonotic Disease in Malaysia.</td>
</tr>
<tr>
<td>26</td>
<td>Factors Affecting Job Satisfaction amongst Public Sector Hospital Pharmacists Working in Selangor, Malaysia.</td>
</tr>
<tr>
<td>31</td>
<td>Pregnancy Outcomes in Insulin Treated Gestational Diabetes Mellitus Patient from Different Ethnicity in Hospital Sungai Buloh.</td>
</tr>
<tr>
<td>33</td>
<td>Tenofovir-Induced Renal Impairment in HIV-Infected Patients.</td>
</tr>
<tr>
<td>36</td>
<td>Evaluation of Continuous Infusion Vancomycin in Hospital Sungai Buloh: Retrospective Observational, Single-Centred Cohort Study.</td>
</tr>
<tr>
<td>44</td>
<td>Knowledge, Attitudes and Practice toward DRG System among Turkish Health Care Providers.</td>
</tr>
<tr>
<td>48</td>
<td>Relationship between Beliefs, Adherence and Quality of Life (QOL) Among Chronic Kidney Disease (CKD) Patients on Haemodialysis in Penang General Hospital.</td>
</tr>
<tr>
<td>51</td>
<td>Validation of EQ-5D-5L in the General Population of Malaysia.</td>
</tr>
<tr>
<td>52</td>
<td>Cost Effectiveness Study of Pantoprazole and Esomeprazole in the Treatment of Upper Gastrointestinal Bleeding at Hospital Taiping.</td>
</tr>
<tr>
<td>59</td>
<td>Comparing the Treatment Outcome for Anthral Gastroitis and Non Ulcer Dyspepsia Using Pantoprazole versus Esomeprazole in an Outpatient Setting in Hospital Tengku Ampuan Rahimah (HTAR).</td>
</tr>
<tr>
<td>60</td>
<td>The Outcome of Home Medication Review Programme in Empowering Psychiatric Patients at HTAR Klang.</td>
</tr>
<tr>
<td>62</td>
<td>Clinical Outcomes of Premature Infants Receiving Total Parenteral Nutrition (TPN) Solution with Amino Acid Concentration of 2.5%W/V Versus 2.8%W/V in NICU, Hospital Selayang.</td>
</tr>
<tr>
<td>64</td>
<td>A Survey to Evaluate the Techniques of Medication Administration through Enteral Feeding Catheters (EFC) for Adult Patients in Nursing Practice in Serdang Hospital.</td>
</tr>
<tr>
<td>72</td>
<td>Structured Intervention for Acute Low Back Pain in Primary Care: A Randomised Control Trial Study.</td>
</tr>
</tbody>
</table>

**Cost and Cost-effectiveness**

<table>
<thead>
<tr>
<th>6</th>
<th>Assessment of Healthcare Professionals’ Knowledge on Interactions of Warfarin with Drugs, Supplements and Nutrients in Hospital Ampang, Malaysia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Coagulation Factor Concentrates Usage in Malaysia 2012.</td>
</tr>
<tr>
<td>25</td>
<td>Survey on Awareness of High Alert Medications among Doctors, Pharmacists and Nurses in Hospital Sungai Buloh (HSgB).</td>
</tr>
<tr>
<td>39</td>
<td>A Study on the Awareness and Compliance towards the After Office Hour Value Added Service in Hospital Sungai Buloh.</td>
</tr>
<tr>
<td>45</td>
<td>Prescriptions Study to Assess Drug Utilization Pattern and Estimate Direct Drug Cost: A Review of Existing Literature.</td>
</tr>
<tr>
<td>46</td>
<td>The Epidemiologic and Economic Impact of a Quadrivalent Human Papillomavirus Vaccine (6/11/16/18) in Malaysia’s Gender Neutral Setting.</td>
</tr>
<tr>
<td>69</td>
<td>A Survey on Self-Medication by Caregivers/Parents of Paediatric Patients in Hospital Tengku Ampuan Rahimah.</td>
</tr>
</tbody>
</table>

**Health Services Research, Healthcare Utilization and Policy**

<table>
<thead>
<tr>
<th>3</th>
<th>Primary Care Setting in Klang: Are Antibiotics Usage Justified?</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>A Survey on Knowledge of Oral Extemporaneous Preparations Amongst Pharmacist and Pharmacist’s Assistants in Hospital Sungai Buloh.</td>
</tr>
<tr>
<td>41</td>
<td>The Effects of Pharmacist Patient Education on the Occurrence of Return Medications in an Inpatient Setting.</td>
</tr>
<tr>
<td>42</td>
<td>A Survey on the Performance of Clinical Pharmacists by Medical Providers in Hospital Sungai Buloh.</td>
</tr>
<tr>
<td>43</td>
<td>Review of Off Label Prescribing in Paediatric Patients in Hospital Sungai Buloh: A Prospective Study.</td>
</tr>
<tr>
<td>54</td>
<td>The State of Health Economics Research in Malaysia.</td>
</tr>
<tr>
<td>56</td>
<td>Analysis of Medication Returned to Hospital Outpatient Pharmacy: A Qualitative focus Group Study.</td>
</tr>
<tr>
<td>67</td>
<td>A Study to Evaluate Patient’s Knowledge and Satisfaction to the Topical Treatment in Chronic Skin Disease.</td>
</tr>
</tbody>
</table>

**Other**

| 37 | Study on the Use of the Intravenous Fish Oil Lipid Emulsion in Premature Neonates Requiring Parenteral Nutrition. |
THE CONTENTS OF THESE ABSTRACTS MAY NOT REFLECT THE VIEWS OF, AND MAY NOT BE ENDORSED BY THE SOCIETY. THIS DOCUMENT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY

ABSTRACT #1
THE INCIDENCE OF ADVERSE EFFECTS DUE TO FLUOROURACIL, EPIRUBICIN AND CYCLOPHOSPHAMIDE (FEC) CHEMOTHERAPY IN BREAST CANCER PATIENTS AT HOSPITAL TENGKU AMPUAN RAHIMAH (HTAR), KLANG.
Norima MN1, Mazni MTN1, Yeow WJ1, Chong YT1, Yeoh JJJ1
Department of Pharmacy, Tengku Ampuan Rahimah Hospital, Klang1
Objective: This study aimed to determine the incidence of adverse effects due to FEC chemotherapy in HTAR Klang. Methods: Sampling population of 20 patients were obtained with the inclusion criteria of female patients more than 18 years old given at least one cycle of FEC regimen in hospital in the year 2012. All haematological and non-haematological adverse events and its management were recorded. Results: The incidences of haematological adverse events were neutropenia (20%), neutropaenic sepsis (15%) and anaemia (5%) while the incidences of non-haematological adverse events were nausea and vomiting (20%), alopecia (20%), extravasation (5%), cough (5%) and headache (5%). Dose delay and dose reduction due to adverse events were observed in 30% and 15% of patients respectively. Secondary prophylaxis with GCSF and antibiotic were used in 8.3% and 1.6% of the total cycle delivered for management of neutropenia or neutropaenic sepsis. Supportive care such as anti-emetics and scalp cooling were given to patients who experienced non-haematological adverse events to improve quality of life. Conclusions: Adverse events observed in this study were generally in line with published data and literature. A prospective study is recommended in near future to add more information on the incidence and clinical management of FEC related adverse events.

ABSTRACT #2
GLYCAEMIC CONTROL OF DIABETIC PATIENTS IN PHARMACIST-MANAGED TELEPHONIC INSULIN TITRATION
Ramelan A1, Lin SN1, Woon SM1, Mohd Noh FA1, Wong KM1, Ibrahim NF1
Department of Pharmacy, Tengku Ampuan Rahimah Hospital, Klang1
Objectives: To compare the reduction of HbA1c between patients who are under pharmacist-managed insulin titration-by-phone program compared to standard care and to study the association between the frequencies of telephone contacts by pharmacists with the reduction in HbA1c. Methods: A retrospective study on diabetic patients under endocrine clinic follow-up in one year between June 2011 and June 2012 in HTAR was conducted. Patients with uncontrolled type 1 or type 2 diabetes mellitus and whose HbA1c>7% were included. Reduction in HbA1c within a minimum of 12 months of referral to the service when compared to baseline was evaluated. Results: A total of 110 patients with 57 patients in the pharmacist-managed insulin titration-by-phone group and 55 patients standard care group were included in the analysis. Between-group comparison demonstrated a significant difference in median change in HbA1c favouring pharmacist management (0.9% for pharmacist-managed group; 0.1% for standard care, p=0.027). Within-group comparisons demonstrated significant correlation between frequency of telephone contacts by pharmacists and reduction in HbA1c level from baseline (r=0.351, p=0.08) in the pharmacist-managed titration-by-phone group. Conclusions: Pharmacist-managed insulin titration-by-phone service under the DMTAC program resulted in significant improvement in HbA1c levels compared to standard care in patients with diabetes mellitus, and the magnitude of reduction in HbA1c correlates with the frequency of contacts by pharmacists.

ABSTRACT #3
PRIMARY CARE SETTING IN KLANG: ARE ANTIBIOTICS USAGE JUSTIFIED?
Cheang CY1, Norharlina S1, Gan KZ1
Pharmacy Unit, Klang District Health Office1
Objective: To study the antibiotics prescribing pattern in government primary care clinics in Klang; detailing the type of antibiotics used for the infections treated in primary care. This study further investigates the judicious use of antibiotics by prescribers in nonspecific upper respiratory tract infections (URTI). Methods: A total of 2,359 prescriptions with a diagnosis of infection from 24 – 28 June 2013 were collected from 10 government clinics. Prescriptions for nonspecific URTI were then randomly selected to review the appropriateness of antibiotic use based on the Mclsaac score, choice of antibiotics, and dosing. Results: The top three diagnoses were nonspecific URTI (62.2%), soft tissue injury (STI) (9.1%) and urinary tract infection (UTI) (9.5%). The antibiotic prescribing rate for nonspecific URTI was 27%, STI 85%, and UTI 83.9%. The most commonly prescribed antibiotics were amoxicillin (52.7%) for URTI, cloxacinil (89.1%) for STI, and cephaloxin (52.2%) for UTI. The most preferred choice of antibiotic for nonspecific URTI and UTI, deviates from local guidelines i.e. tetracycline/penicillin for URTI and trimethoprim for UTI. For non-specific URTI, 84.1% of patients prescribed with antibiotics had Mclsaac score of <2 (antibiotic is likely to be not necessary). Also, 95.2% of patients were first-visit patients – indicating that the antibiotic delay strategy is not popular among prescribers. Conclusions: This study revealed the choice of antibiotic for both URTI and UTI were inconsistent with local guidelines and that there was inappropriate prescribing in URTI. Besides adhering to prescribing guidelines, healthcare providers could have a collaborative effort to improve antibiotic prescribing.

ABSTRACT #4
A STUDY OF CEPHALOSPORIN USE IN FEMALE MEDICAL WARD IN HOSPITAL BANTING
To CY1, Azza A1, Norhamiza H1, Nurul Izatty A1
Department of Pharmacy, Banting Hospital1
Introduction: Bacterial infections continue to present a major threat to human health. Nowadays there are more than 100 of antimicrobials in the market. The proper selection antimicrobial therapy is based on several factors. The cephalosporin are the largest and most diverse family of beta-lactam antibiotics. Inappropriate use of antimicrobials is a risk factor for the emergence of antibiotic resistant bacteria. Hence, we conducted a study of cephalosporin use in medical ward in Hospital Banting. Objectives: The objective of the present study was to evaluate the appropriateness use of cephalosporins in female medical wards Hospital Banting in term of indication, dose, frequency and duration of antibiotics. Methods: A cross sectional study was done for patients in the female medical ward (ward 3) who was treated with any of the cephalosporin antibiotics between January and April 2013. National Antibiotic Guideline, Sanford Antibiotic Guide 2000 were used to determine the appropriateness. All statistical analyses were performed using SPSS version 17 (SPSS Inc, Chicago, IL) and compared using chi-square (X2) tests. Results: The proportion of inappropriate therapy with Cephalosporin was higher in empiric therapy compared with treatment with 61.4% and 38.8% respectively. More patients receive inappropriate therapy when bacteria investigations were not done (50%) compared with those whom bacteria growth was proven (13.6%) and no growth was proven (36.3%) by bacteria investigations. There was a significance association between the type of antibiotic and inappropriate use of Cephalosporin (p<0.006). The most common antibiotic that has been used inappropriately is Ceftriaxone with 45.5%. Conclusions: The use of antibiotics in this study was not fully in line with the compared antibiotics guidelines especially the duration of antimicrobial therapy. More patients receive inappropriate therapy during empirical treatment. Future studies are needed to promote rational use of cephalosporin antibiotics in female medical ward in Hospital Banting.

ABSTRACT #5
BRING BACK MEDICATION: A STUDY OF PATIENTS’ AWARENESS, COST SAVED AND STORAGE PRACTICE IN SELAYANG HOSPITAL
Khoof HF1, Ang YJ1, Lim XY1, Cheok KY1, Sabastian SS1, Lim CH1, Geh SW1, Leong SL1
Department of Pharmacy, Selayang Hospital1
Introduction: ‘Bring Your Medications’ awareness has been introduced to create patients’ awareness to bring along their medications during ward admission, where medication reconciliation can be done to minimize wastage and save cost. However, these medications are no longer assured with their quality due to unknown storage conditions. Methods: Consecutive patients – indicating that the antibiotic delay strategy is not popular among prescribers. Conclusions: This study revealed the choice of antibiotic for both URTI and UTI were inconsistent with local guidelines and that there was inappropriate prescribing in URTI. Besides adhering to prescribing guidelines, healthcare providers could have a collaborative effort to improve antibiotic prescribing.
practice of medication. Methods: This was a prospective, non-interventional study conducted in Sebayar Hospital’s Nephrology and Medical wards in 30 days who brought along their medications were recruited. CP1 Medication History Assessment Forms were used to assess and record patients’ previous medications. Interview sessions were conducted with patients using an adapted version of a previously validated questionnaire to survey patients’ storage practice of medication.

Upon discharge, the number of pills saved was estimated according to patients’ balance medication from previous supply which can still be used. The total cost was calculated by using the hospital’s price list. Haematopoeitic Patients' awareness was expressed in terms of percentage of patients who brought back medications upon admission. Results: 53% of patients brought back their medications on admission. There is an increase of 40.3% from the 12.7% achieved from an earlier study conducted in 2011. This may be attributed to the continuous “Bring Back Medication” awareness promoted hospital wide. A total of 20,450 pills with a total cost of RM 4,647.82 were saved. 77.4% of patients brought their medications in the original packaging. 62.3% of the patients kept their medications in drawers/cabinets, 28.5% in open area, 4.2% in the fridge, and 5.0% in other conditions e.g. in car and bags. Of the 239 patients interviewed, 28% were aware of and checked the expiry dates of medications, 60.3% were aware of but did not check the expiry dates and only 11.7% were not aware of the expiry dates.

Conclusions: Patients’ awareness of bringing back their medications upon admission has increased since 2011. A total cost of RM 4,647.82 was saved. Majority stored their medications in appropriate conditions but did not check for expiry dates. Continuous promotion for patients to bring back medications need to be carried out to further increase the awareness to a target of 80% as agreed by the hospital administrative level.

ABSTRACT #6

ASSESSMENT OF HEALTHCARE PROFESSIONALS’ KNOWLEDGE ON INTERACTIONS OF WARFARIN WITH DRUGS, SUPPLEMENTS AND NUTRIENTS IN HOSPITAL AMPANG, MALAYSIA.

Lo SY, Md Shukor NZA, Md Yunus YA, Kong SB, Foo WF, Lee WLU, Lim YS

Department of Pharmacy, Ampang Hospital

Introduction: Warfarin is a highly effective anticoagulant in the management of thrombembolic disease. Anticoagulants are identified by the National Patient Safety Agency (NPSA) as one of four high risk medications that require multidisciplinary interventions to ensure its safe use. Bangladesh study was conducted to elucidate the gap between what healthcare professionals know and their practice. Objectives: This study aims to evaluate healthcare professionals’ knowledge towards interaction of warfarin with drugs, supplements and dietary vitamin K in Hospital Ampang. Methods: Healthcare professionals were surveyed using a validated questionnaire that are comprised of Part I: Drug-Supplement Interactions with Oral Warfarin and Part II: Food Interactions with Oral Warfarin. The study sample included 127 healthcare professionals consisting of 82 physicians, 40 pharmacists and 5 dieticians based on proportional stratified sampling. The survey consisted of 50 questions on drug-nutrient interactions of warfarin. Results: The mean scores (±SD) on the overall test were 60.17±1.3 for pharmacists, 55.43±1.0 for pharmacists and 44.6 ±8.1 for physicians, with 100 being the perfect score. Test results revealed that pharmacists scored significantly highest in Part I drug-supplement interactions with 45.62±13.3. For Part II food interactions, dieticians scored significantly highest with mean score of 84.5±1.1 (p<0.05). Physicians from Haematology Department scored significantly higher than other departments for the Part I and overall scores (p<0.05). Besides, healthcare professionals were able to correctly identify Vitamin K rich food, scoring an average of 79.4% and significantly highest with 97.8% in dieticians. This could contribute to increase in waiting time. Conclusions: This study helps to identify the extent to which unauthorized prescription contributes to total waiting time more than 30 minutes in Hospital Ampang. Methods: This cross sectional study was carried out by using a data collection form which was place at the dispensing counter of OPD Hospital Ampang and generated data from e-His from 25th February 2013 until 30th June 2013. Results: Throughout 18 weeks of this study, an average processing time of 13.36 minutes was found that 3,252,313 medications were filled out of total 64,061 prescriptions had waiting time more than 30 minutes. Out of this, 136 (5.4%) over total of 2,488 unauthorized prescriptions took more than 30 minutes to be dispensed whereas 240 (6%1) unauthorized prescriptions were authorized between 5 to 90 minutes. On the end of this study, it was found that unauthorized prescription does increased the total waiting time in OPD. Although the result obtained showed that unauthorized prescription only causes a small percentage in affecting waiting time more than 30 minutes, a future research could be conducted to further identify factors which could possibly lead to an increase in waiting time.
ABSTRACT #14
SYSTEMATIC REVIEW OF ECONOMIC EVALUATION MODELS USED FOR COST-EFFECTIVENESS ASSESSMENTS OF HEALTH PROMOTION PROGRAMS FOR CHILDHOOD OBESITY

Lim CC’, Shafie AA’, Ahmad Hassali MA, Baba Y’, Hamzah F’ School of Pharmaceutical Sciences, Universiti Sains Malaysia; MySihat’ School of Pharmacy Enforcement, Ministry of Health, Malaysia

Objectives: To assess the cost-effectiveness of childhood obesity promotion programs for childhood obesity. The study was not powered to detect adverse events.

Methods: This was a systematic review of the anticoagulation management models. A random number generator was used to recruit patients. The mean total cost of insulin, the mean costs of monitoring, clinic consultation, and drug and adverse event

Conclusions: In summary, BB was more effective and cost-effective than SS in reducing the percentage of obese cohort and improving the level of knowledge, and practice after 6 months.

ABSTRACT #15
DETERMINATION OF COST-EFFECTIVENESS THRESHOLD FOR MALAYSIA

Lim YW’, Shafie AA’, Chua GN’, Hassali MA’ School of Pharmaceutical Sciences, Universiti Sains Malaysia’

Objectives: Decision on the cost-effectiveness (CE) of healthcare technologies usually creates an argument especially when alternatives are more expensive but more effective. In this situation, external criterion in the form of CE threshold or willingness-to-pay for a quality-adjusted life-year (WTP/QALY) needs to be applied to decide on its CE. Nevertheless, the lack of empirical and well-accepted CE threshold in Malaysia is recognized as one of the most important barriers in using health technology assessment in policy decisions. This study is mainly to determine the monetary values of a QALY across Malaysian population.

Methods: A cross-sectional, contingent valuation study was conducted using stratified multistage cluster random sampling technique in Penang, Kendah, Selangor and Kuala Lumpur. A health-economic survey was done to determine the monetary utility of life and their WTP for a hypothetical scenario (treatment, extended life in terminal illness and lifesaving situations with three severities and two QALY levels: 0.2 QALY and 0.4 QALY) using two WTP questionnaires. Interval model analysis was applied to determine the CE threshold.

Results: One thousand thirteen respondents aged between 20–60 years old who can understand either English or Malay language were interviewed face-to-face. The mean value of CE threshold was determined at the range of MYR 19,919.00 to MYR 28,495.00 (~USD 6,200 to USD 8,900). Conclusions: By comparing our results to Malaysian GDP per capita in the year 2011; ~MYR 50,560 (~USD 15,800), we noted that mean WTP/QALY ranged between 0.39–0.56 times of GDP per capita.
**ABSTRACT #19**

**ANTIBIOTIC USE, EXPENDITURE AND OUTCOMES AT KAJANG HOSPITAL: THE IMPACT OF ANTI-MICROBIAL STewardship (AMS) PROGRAM**


**Department of Pharmacy, Kajang Hospital**

**Introduction:** In 2010, among the government hospitals in Selangor, Kajang Hospital was reported to be the ‘top users’ for 6 types of antibiotics and had the highest expenditure for antibiotics. These may indicate excessive and inappropriate usage of antibiotics. **Objectives:** The purpose of the study is to evaluate the impact of a multidisciplinary antibiotic stewardship program (Antibiotic-MEDIFACT) on the antibiotic consumption, expenditure and bacterial resistance. **Methods:** The program was formed in June 2011 with 4 strategies: Standard antibiotic order forms with preauthorization requirements for 9 restricted antibiotics, education, audits and feedbacks. Use of antibiotics was recorded in defined daily doses per 1000 patient-days. Costs of antibiotic expenditures were collected 1.5 years before and 1.5 years after the intervention. Fluxuation in drug prices were eliminated by using the average cost of each antibiotic dosage form over the 3 years of the study period. Average bed occupancy over 3 years of the study period was used in order to avoid overestimation of economic impacts of the intervention. Bacterial resistance rates were recorded based on antibiogram data from pathology laboratory data. **Results:** The intervention was associated with a significant reduction of use of Ceftoperazone/Subltamox (p=0.007), Ceftriaxone (p=0.019) and Vancomycin (p=0.007). Usage of other antibiotics i.e. Aztreonam, Meropenem, Imipenem, Piperacillin/Tazobactam and Polymyxin B has reduced but it was not statistically significant. Total reduction in antibiotic expenditure was RM 268,069.60 and reduction in expenditure of 9 restricted antibiotics was RM 15786 per month and this intervention period (95% CI RM 8299–25278; p=0.001). The frequency of Ceftazidime-resistant Pseudomonas aeruginosa strains have decreased from 22% to 7% (p=0.04). The frequency of Polymyxin B-resistant Acinetobacter baumanni strains, Pseudomonas aeruginosa strains with high level of carbapenem resistance (ESBLs), Aeromonas hydrophila and Moraxella fortuita strains have decreased by 51%, 19%, 8% and 39% respectively. **Conclusions:** The Antibiotic-MEDIFACT program was associated with reduction in antibiotic use, cost and bacterial resistance. This results support the notion that a systematic antibiotic program.
Routine use of anticholinergic drug along with AAP could not be justified and should be used only in selected cases of patients.

**ABSTRACT #21**

**INCIDENCE AND CAUSALITY IN ADVERSE DRUG REACTION-RELATED ADMISSION TO HOSPITAL: A SYSTEMATIC REVIEW**

SA MK1, YH M2, AMADUDHA PS1

**Department of Pharmacy, Kajang Hospital**

Introduction: Adverse drug reaction related hospitalization has related to the increase in the physical cost of treatment, admissions rates to get acute treatment and control of patients, as well as time and energy for the staff to accommodate the congestion. **Objectives:** To assess the incidence of reported adverse drug reaction related admissions to hospitals including presenting symptom, medication used, hospital departments. **Methods:** A systematic literature review in Medline. Papers included were preventable and non-preventable adverse drug reactions admitted to hospital following the WHO definition of adverse drug reactions, adult patients (above 18 years old) and papers that were published from year 1973 until present. Trial drugs, intentional drug overdosing, expert opinions, editorials as well as conference abstracts and non-English papers were excluded. MeSH terms and keywords such as adverse drug reactions, drug toxicity, drug hypersensitivity, hospitalization, hospital admission and adult were used. The review followed PRISMA statement guidelines. The data abstraction tool were used to extract the data and finally cross-reviewed by two assessors. **Results:** The median percentage for incidence rate was 5.5% that ranges from 0.1% to 53% according to the included studies. The median percentage of preventable adverse drug reaction related admissions was 63% ranging from 2.6% to 91%. Common drugs causing adverse drug reactions were antipsychotics (23.5%) followed by analgesics (12.4%) and cardiovascular agents (10.8%). Apparently, the body systems that were most affected by adverse drug reactions were gastro-intestinal (12.2%), skin (11.4%) and circulatory system (10.2%). Eight studies reported more than 70% preventability rate particularly in the geriatric population while death due to ADRs were reported from 0.05% (n=1) 0.22% (n=73). The Newcastle-Ottawa quality assessment scale by Wells et al (2009) was tested on 31 cohorts, 22 cross-sectional and five case control studies. Of the included studies, 82.2% scored a minimal five point and above and can thus be categorized as moderate to good study quality. **Conclusions:** The findings from this systematic review suggest that the frequencies for the incidence rates and preventable ADRs reported during hospital admissions were widely varied between eligible studies. The incidence rates have not changed significantly over the years despite the high rates of potential preventability.

**ABSTRACT #22**

**ECONOMIC EVALUATION OF FOOD WATER BORNE DISEASE IN MALAYSIA**

Mohd Dawam ND1, Wan Puteh SE1

Department of Community Medicine, UKM Medical Centre1

**Introduction:** Food borne disease causing a significant impact on economic if the incidence of the disease is keep increasing without proper surveillance and outbreak control. Food borne disease in Malaysia is in the rise and the direct and indirect cost management of these diseases will become one of the main economic issues to face by the government. Therefore, these study will analyse the cost involve in managing food water borne disease and how it related to economic burden to the individual, provider and community.

**Objectives:** To evaluate the economic burden of food water borne disease in Malaysia by calculating the cost and DALY of Cholera, Typhoid and Food Poisoning specifically. **Methods:** A cross-sectional study to be carried out in April 2014 until December 2014 that combines economic evaluation methods and Disability Adjusted Life Year (DALY) to estimate the economic burden of food and water-borne diseases as well as the costs involved in the management of this disease specifically for Cholera, Typhoid and Food Poisoning. These study locations are in National University Hospital, Kajang Hospital, Kuala Lumpur Hospital and two districts namely Hulu Langat and Petaling.

**Results:** Expected results of the study are the total cost of food water borne disease in view of healthcare provider and patient. Other than that, the burden of the food borne disease will be show by calculating the Disability Adjusted Life Years. At the end of the study expected to show the economic burden of the food water borne disease by calculating cost per disability adjusted life years (DALY). **Conclusions:** Economic evaluation studies of food water borne disease are intended to show the real burden of food water borne disease in Malaysia. By showing the total cost and calculating cost per disability adjusted life years.

**ABSTRACT #23**

**ECONOMIC EVALUATION OF ZOONOTIC DISEASE IN MALAYSIA**

Omar N1, Wan Puteh SE1

Department of Community Medicine, UKM Medical Centre1

**Introduction:** Zoonoses have been defined as diseases and infections that are transmitted between vertebrate animals and humans. Some zoosine are said to account for 60% of all infectious disease pathogens and 75% of all emerging pathogens. **Objectives:** To determine economic burden of three prevalent zoonotic diseases in Malaysia: Brucellosis, Leptospirosis, Malaria and Chikungunya by calculating the provider’s cost in managing the cases involved. **Methods:** This cross sectional study will be conducted from June 2014 till December 2014. The cost of treatment of these zoonotic diseases will be calculated based activity based costing methods. Secondary data from the Ministry of Health will be used to estimate the cost. **Results:** This study is expected to give the total cost of the three zoonotic diseases in view of provider’s cost. Cost of treating and projected to the next 5 years also expected to be calculated from this study. **Conclusions:** The current and projected cost burden estimations can help the nation to place strategic management focus on areas of neglect and improve collaborative efforts between the medical and veterinary community for the further future progress and improvement in these areas.

**ABSTRACT #24**

**OVERVIEW OF THE SAMPLING PATTERN OF SUSPECTED PARACETAMOL (PCM) POISONING IN HOSPITAL SUNGAI BULOH (HSB)**

Nurfazeeza NK, Ang SY1

Department of Pharmacy, Sungai Buloh Hospital1

**Introduction:** Paracetamol (PCM) is a popular poisoning agent. Main concern with paracetamol overdose is the hepatotoxicity effect and N-acetylcyctein (NAC) known to be its effective antidote. Wrong sampling time and delayed results obtained may lead to mismanagement of PCM poisoning. Hence, the aim of the study is to observe the sampling pattern of the TDM in the management of the suspected PCM poisoning in HSB.

**Objectives:** To evaluate the appropriateness of the sampling time and processing time of the suspected PCM TDM sampling, the factors identified for delayed release of the acetaaminophen level result and also the appropriate use of NAC in the management of acetaminophen toxicity. **Methods:** This cross sectional study was conducted in HSB. All orders sent for TDM PCM toxicity from 1st January 2012 to 31st October 2012 was collected through the electronic hospital information system (eHIS). Incomplete data and rejected sample was excluded. Appropriateness of sampling and processing time as well as usage of NAC were expressed in percentage while the identified factors (status of order (urgent/ routine) and time of sample received) affecting the delay of processing time was analysed using chi-square test where $p<0.05$ were considered significant. **Results:** 26% of the 185 samples are suspected of PCM poisoning and percentage of preventable adverse drug reaction related admissions was 59.4% of samples ordered as urgent compared to routine drug. The median percentage for incidence rate was 5.5% that ranges from 0.1% to 53% according to the included studies. The median percentage of preventable adverse drug reaction related admissions was 63% ranging from 2.6% to 91%. Common drugs causing adverse drug reactions were antipsychotics (23.5%) followed by analgesics (12.4%) and cardiovascular agents (10.8%). Apparently, the body systems that were most affected by adverse drug reactions were gastro-intestinal (12.2%), skin (11.4%) and circulatory system (10.2%). Eight studies reported more than 70% preventability rate particularly in the geriatric population while death due to ADRs were reported from 0.05% (n=1) 0.22% (n=73). The Chinese Cup quality assessment scale by Wells et al (2009) was tested on 31 cohorts, 22 cross-sectional and five case control studies. Of the included studies, 82.2% scored a minimal five point and above and can thus be categorized as moderate to good study quality. **Conclusions:** The findings from this systematic review suggest that the frequencies for the incidence rates and preventable ADRs reported during hospital admissions were widely varied between eligible studies. The incidence rates have not changed significantly over the years despite the high rates of potential preventability.

**ABSTRACT #25**

**SURVEY ON AWARENESS OF HIGH ALERT MEDICATION AMONG DOCTORS, PHARMACISTS AND NURSES IN HOSPITAL SUNGAI ULLOH**

Sia HP1, Bay EL1, Tei YM1

Department of Pharmacy, Sungai Buloh Hospital1

**Introduction:** Improving medication safety for High Alert Medications (HAMS) remains a major concern for health professionals. Most medication errors may cause no harm to patients but inappropriate administration of HAMS can cause serious injuries and deaths. The purpose of this research is to assess the awareness of HAMS among the health professionals in HSB.

**Objectives:** This study is done to explore the awareness of High Alert Medication among health professionals, to assess the awareness of staffs on interventions done by the High Alert Medication committee at improving awareness about High Alert Medication and to identify common causes of medication errors involving High Alert Medication based on staff perception. **Methods:** A cross-sectional survey based study was conducted. Survey comprising of 15 items were randomly distributed within 2 weeks to 77 participants which included doctors, pharmacists and nurses serving in selected critical and non-critical wards of HSB. Selected critical wards include Intensive Care Unit (ICU), High Dependency Ward (HDW) and Coronary Care Unit (CCU) while selected non-critical wards include Ward 4A, 4C, 4D, 5C and 7B. SPSS Software and Microsoft Excel were used for data analysis. Data was analysed using descriptive methods and inferential statistics. Out of the 77 respondents, 32.5% were doctors, 14.3% were pharmacists and 53.3% were nurses. Only 46.8% respondents attended HAM briefing before this survey. The respondents indicated that the interventions implemented were able to increase their awareness and knowledge on HAM while 75.3% felt that these able to help prevent or reduce medication error.
ABSTRACT #26
FACTORS AFFECTING JOB SATISFACTION AMONGST PUBLIC SECTOR HOSPITAL PHARMACISTS WORKING IN SELANGOR, MALAYSIA

Hing YL1, Ezmiza N1
Department of Pharmacy, Sungai Buloh Hospital

Introduction: Job satisfaction (JS) studies targeting public sector hospital pharmacists working in Malaysia is still largely an unexplored area. Thus, JS levels and factors affecting them were measured amongst public sector hospital pharmacists working in the state of Selangor, Malaysia.

Methods: A previously validated JS questionnaire was mailed to all 327 active pharmacists working in all Selangor public hospitals. Data was collected from mid-April to end of June 2012. The questionnaire contained questions; graded with a 5-point “strongly agree” (5) to “strongly disagree” (1) scale; that examined extrinsic and intrinsic factors and assessed job satisfaction levels via two separate scales, abbreviated as JS1 and JS2, to allow reliability and correlativity cross checking with analysed factors. Results: 179 completed questionnaires were returned, eliciting a response rate of 54.7%. Most pharmacists were somewhat satisfied with their job, scoring on average 3.09 ± 0.92 and 3.20 ± 0.89 for JS1 and JS2 respectively. Spearman correlation scores indicated significant correlation between intrinsic factors (rJS1=0.55, rJS2=0.52, P<0.01) and extrinsic factors (rJS1=0.66, rJS2=0.52, P<0.01) with JS. Most intrinsic factors were addressed fairly well, with job creativity and importance as significant predictors for JS. Management concern and opportunity for advancement were extrinsic factors that needed improvement given they are significantly linked to JS. Stepwise multiple regression revealed only extrinsic factors were significantly correlated with JS (r2JS1=0.56, P<0.0001; r2JS2=0.27, P<0.0002), implying that extrinsic factors are predominant significant predictors towards JS. Such findings may be due to socioeconomic and cultural influences of Malaysian society towards JS. Conclusions: Overall, Selangor hospital pharmacists were quite satisfied with their job. More attention should be paid to extrinsic factors which have stronger influence over job satisfaction compared to intrinsic factors.

ABSTRACT #27
PERCEPTION, ACCEPTANCE AND TOLERABILITY OF PATIENTS TAKING INNOVATOR VERSUS GENERIC ESCITALOPRAM

Hing YL1, Lim SY1
Department of Pharmacy, Sungai Buloh Hospital

Introduction: Generic drugs have been introduced into government hospitals working in Malaysia is still largely an unexplored area. Thus, JS levels and factors affecting them were measured amongst public sector hospital pharmacists working in the state of Selangor, Malaysia.

Methods: A previously validated JS questionnaire was mailed to all 327 active pharmacists working in all Selangor public hospitals. Data was collected from mid-April to end of June 2012. The questionnaire contained questions; graded with a 5-point “strongly agree” (5) to “strongly disagree” (1) scale; that examined extrinsic and intrinsic factors and assessed job satisfaction levels via two separate scales, abbreviated as JS1 and JS2, to allow reliability and correlativity cross checking with analysed factors. Results: 179 completed questionnaires were returned, eliciting a response rate of 54.7%. Most pharmacists were somewhat satisfied with their job, scoring on average 3.09 ± 0.92 and 3.20 ± 0.89 for JS1 and JS2 respectively. Spearman correlation scores indicated significant correlation between intrinsic factors (rJS1=0.55, rJS2=0.52, P<0.01) and extrinsic factors (rJS1=0.66, rJS2=0.52, P<0.01) with JS. Most intrinsic factors were addressed fairly well, with job creativity and importance as significant predictors for JS. Management concern and opportunity for advancement were extrinsic factors that needed improvement given they are significantly linked to JS. Stepwise multiple regression revealed only extrinsic factors were significantly correlated with JS (r2JS1=0.56, P<0.0001; r2JS2=0.27, P<0.0002), implying that extrinsic factors are predominant significant predictors towards JS. Such findings may be due to socioeconomic and cultural influences of Malaysian society towards JS. Conclusions: Overall, Selangor hospital pharmacists were quite satisfied with their job. More attention should be paid to extrinsic factors which have stronger influence over job satisfaction compared to intrinsic factors.

ABSTRACT #28
PATIENT’S OWN DRUGS: PROFILE OF DRUGS’ COST AND WASTAGE

Nadja AR
Department of Pharmacy, Sungai Buloh Hospital

Introduction: Patient’s Own Drugs (PODs) are medications that patients have obtained in the community setting and have brought with them to the hospital upon admission. When patients bring their previous medications, often these medications are not being used as they are supplied to the patients by inpatient pharmacy. This leads to wastage on hospital resources and patients’ own supply can be used instead. The aim of this study is to determine the cost of wastage incurred when PODs brought from home were not used during hospital stay. The classification and quantity of PODs as well as the most costly medication are also determined. Objectives: 1. To calculate the total cost that has been incurred when PODs are not being used. 2. To identify the quantity and classes of PODs brought in. 3. To determine the class of drug that has the highest cost. Methods: This is a descriptive study. A total of 100 patients admitted into both male and female medical ward of Hospital Sungai Buloh were recruited during the period of one month from 15th September to 15th October 2011. Subjects were recruited via convenient sampling and patients who were admitted during the weekends or medications that were changed by doctors during hospital stay were excluded from this study. The study data was analysed using Microsoft Excel software. Results: A total of 45 subjects were analysed. Eight classes of drugs were identified – oral hypoglycans, anti-hypertensives, lipid-lowering agents, diuretics, cardiovascular agents, anti-diabetics, psychiatric agents and others. Total cost for these medications was RM 250.30. Out of the eight classes, anti-hypertensive drugs were the most costly with RM 97.91. On average, the cost of medications per patient per day was RM 0.46. Assuming if beds are occupied throughout the year (365 beds), then the total wastage cost from the medications that are taken from patients’ own supply can be approximately RM 4,902.40. Conclusions: In conclusion, medication wastage is evident in the inpatient setting when patients’ own supply of medications was not used instead. However, a more thorough audit is needed to determine the exact cost and its impact of using patients’ own drugs. It provides as a platform to implement a healthcare policy on patients’ own drugs in the future.

ABSTRACT #29
STUDY ON THE CLINICAL OUTCOME OF PHARMACIST-MANAGED DIABETES PATIENTS

Siti AZ, Hasnur SH, Chin KC, Zalli ME1
Department of Pharmacy, Sungai Buloh Hospital

Introduction: Glycaemic control is the key to reduce both micro- and macro-vascular complications associated with type 2 Diabetes Mellitus. In Hospital Sungai Buloh, pharmacists play their role in managing diabetic patients through interventions done in Diabetes Medication Therapy Adherence Clinic (DMTAC) which is in operation since 2008. Objectives: To evaluate the clinical outcomes in diabetic patients in terms of reduction in HbA1c and fasting blood sugar (FBS) through interventions done in Diabetes Medication Therapy Adherence Clinic (DMTAC). Methods: A retrospective and observational study among patients enrolled in the DMTAC program was conducted between February 2012 and July 2013. Data was included from patients with uncontrolled DM having glycosylated haemoglobin (HbA1c) more than 6% and who had visited more than three times with the pharmacists. The descriptive analysis was used to analyse data on patients demographic and medication regimens associated with diabetes. For statistical analysis, a paired t-test and Wilcoxon Signed-Rank test was used to evaluate the differences between pre- and post-values of HbA1c and FBS. Results: A total of 65 patients were included in the analysis. Most patients in this study aged between 51 to 60 years old (36.9%). Majority of the patients were males (60%). Malays dominate the highest ranking (80.3%), followed by Indians (11.8%) and Chinese (7.9%). For macro complications, 70.8% patients do not state any macro complication. However, 26.2% of all patients are complicated with angiopathy. The most common micro complication is diabetic nephropathy (21.5%), retinopathy (18.5%) and neuropathy (7.7%). A mean reduction in HbA1c of 1.168% (p<0.001) and mean reduction in FBG of 3.87mmol/l (p=0.004) were achieved. Conclusions: The pharmacist-managed diabetes patients in the DMTAC program resulted in significant improvements in HbA1c and fasting glucose levels.

ABSTRACT #30
USAGE OF IV IAC IN ICU PATIENT WITH RENAL INSUFFICIENCY: PREVENT CONTRAST-INDUCED NEPHROPATHY

Hannah MM1, Nur Syazreen AS1
Department of Pharmacy, Sungai Buloh Hospital

Introduction: Nephrotoxicity is a major complication that occurs within 3 days of administration of iodine contrast medium intravenously. Studies have shown that combined hydration therapy with oral NAC given a day prior to and on the day of administration of contrast medium, may prevent nephrotoxicity event in chronic renal failure patients. Both NAC and IV administration of NAC are limited because of the need to have access to IV line and high cost of the medication.
of contrast and additional dose over subsequent 4 hours has been advocate for for preventing contrast-induced nephropathy (CIN). However, the effectiveness of NAC for this indication is still under investigation.

**Introduction:**

Gestational Diabetes Mellitus (GDM) is associated with substantial rates of maternal and perinatal complications such as macrosomia, low birth weight, and neonatal hypoglycaemia. Unquestionably, there are ethnic differences in the prevalence of GDM. Most studies found Asian women are at higher risk of getting GDM compared to Indian and Caucasian. However, lack of related studies can be found in Malaysia.

**Objectives:**

The objective of the study is to determine prevalence of GDM in different ethnicity and to evaluate adverse pregnancy outcomes from different ethnicity. Patients and Methods: Retrospective study of all women who delivered at Hospital Sungai Buloh (n=5,957) which diagnosed with GDM patient. Adverse pregnancy outcomes including birth weight, gestational age, preeclampsia, delivery method, NICU stay more than 24 hours were recorded. Kruskal-Wallis analysis for continuous variables and Pearson's chi-square for categorical variables were used.

**Results:**

In our study from January 2013 until June 2013, the prevalence for gestational diabetes mellitus among pregnant women is 11.52%. From 5,957 women, only 696 women were diagnosed with GDM. Among of all, 156 patients were treated by insulin. Indians contributed in gestational diabetes mellitus prevalence the most (25.1%), followed with the Chinese 12.4% and Malays 11.1%. As for method of delivery, caesarean delivery was significantly higher compared to spontaneous delivery (p<0.05). However, there is no significant difference between different ethnicity for other outcomes (p>0.05).

**Conclusions:**

The prevalence of GDM in this study (11.52%) fall in high risk population. Indians contributed the highest prevalence of GDM compared to the Chinese and Malays. In this study, there is no significant difference in caesarean method delivery. Further study is needed to study the relationship between pregnancy outcome and ethnicity. Hence, we can intensify the treatment in high risk ethnic.

**ABSTRACT #32**

**CORRELATION OF PHENOTYP LEVEL WITH RABDOMYOSIS AND THROMBOCYTOPENIA IN CRITICALLY ILL PATIENTS WITH HYPOALBUMINEMIA**

Rahela AK*, Shing Chyi Li’1, Sinn Yin A1, Norimawati S1, Hannah MT1, Ee Ling B1, Wei Leong L1, Shanthi R1

**Introduction:** Phenotyin is widely used for traumatic brain injury patients in Intensive Care Unit (ICU) of Hospital Sungai Buloh (HsB). Phenotyin has been reported to induce rhabdomyolysis, where there is breakdown of muscle and results in raised Creatine Kinase (CK) level. In Renal Toxicity, phenotyin is known to induce thrombocytopenia, a rare but serious haematological adverse effect. Objectives: To evaluate the impact of sub-therapeutic or toxic levels of phenotyin towards rhabdomyolysis and thrombocytopenia, and investigate other factors that may affect phenotyin level.

**Methods:** Medical records of 70 patients admitted to Intensive Care Unit of HsB prescribed with phenotyin from October 2011 to May 2012 were retrieved. 61 patients with hypoalbuminemia (albumin <35 g/L) were identified. PK and Platelet level, phenotyin, albumin and phenotyin level were analyzed using 2 way chi-square test. Results: The mean age of the 61 patients was 31.8 ± 8.7 years (range 20 to 57 years). The subjects had traumatic brain injury, subarachnoid haemorrhage or epilepsy. Sub-therapeutic (less than 40 µmol/L) and toxic level (more than 80 µmol/L) were associated with increased CK level compared to normal phenotyin level. However, it was not statistically significant (p>0.05). Toxic level of phenotyin compared to sub-therapeutic and normal level of phenotyin was associated with significant correlation between phenotyin and albumin (p<0.05). Low albumin level (less than 20 g/L) was associated with significant phenotyin toxicity (p<0.05).

**Conclusions:** Rhabdomyolysis is easily affected by other factors, thus Creatine Kinase (CK) is not a strong indicator to predict phenotyin level. However, the correlation and very low albumin level may play a role in predicting phenotyin toxicity.

**ABSTRACT #33**

**TENOFOVIR-INDUCED RENAL IMPAIRMENT IN HIV-INFECTED PATIENTS**

Preethi R1, Aiman M1

**Department of Pharmacy, Sungai Buloh Hospital**

Introduction: Tenofovir disoproxil fumarate (TDF) was the preferred nucleoside reverse transcriptase inhibitor (NRTI) when starting therapy for HIV patient with exception in pregnant women. Tenofovir is mainly eliminated through kidneys hence its use was associated with reduced renal function. TDF was considered safe drug, well tolerated and recommended as a first line in the triple agent combination therapy. Upon practice use, it was found out that there was not uncommon number of patients develop renal impairment. Objectives: To estimate the prevalence of Tenofovir-induced renal impairment in HIV-infected patients and to determine whether median eGFR after Tenofovir was started differ from median eGFR before Tenofovir was started. Methods: A retrospective cross sectional study was conducted among outpatients (department OPD) (patient (n=73) receiving TDF in Hospital Sungai Buloh from January 2011 to January 2014) with duration of eGFR ranging from 2 weeks to 5 years. Patients with comorbidities, pre-existing renal impairment, does not take serum creatinine baseline level prior to TDF treatment, does not follow up and discharged to other hospital was excluded from the study. A definition from National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF KDOQI) was used to defined the renal impairment which was GFR less than 60 mL/min/1.73m2. Results: The result was one patient (1.37 %) having its eGFR value fall below 60 mL/min/1.73m2. There was a significant difference (p<0.05) in median eGFR before and after TDF was initiated. Conclusions: In conclusion, prevalence of renal impairment in patient taking TDF was 14 in 1,000 patients and renal function was significantly reduced after TDF was initiated, hence it was advisable for all patient receiving TDF to be counsel on the possible side effect of renal impaired and close monitoring of renal function is warranted among patients with risk factors.

**ABSTRACT #34**

**PENDING AUTHORIZATION IN OUTPATIENT PHARMACY OF HOSPITAL SUNGAI BULOH**

Sivakumar N1

**Department of Pharmacy, Sungai Buloh Hospital**

**Introduction:** In Outpatient Pharmacy of Hospital Sungai Buloh, pending authorization has been identified as one of the factors that may increase patients waiting time as well as increase pharmacists workload. Objectives: To determine the time taken for authorization has been identified as one of the factors that may increase patients waiting time as well as increase pharmacists workload. patients with pending authorization were obtained from data collection. It counts for about 4% of the total prescription received in October. The result was one patient (1.37%) having its eGFR value fall below 60 mL/min/1.73m2. There was a significant difference (p<0.05) in median eGFR before and after TDF was initiated. Conclusions: In conclusion, prevalence of renal impairment in patient taking TDF was 14 in 1,000 patients and renal function was significantly reduced after TDF was initiated, hence it was advisable for all patient receiving TDF to be counsel on the possible side effect of renal impaired and close monitoring of renal function is warranted among patients with risk factors.

**ABSTRACT #35**

**COST ANALYSIS OF THE EXTEMPORANEOUS PREPARATION OF FOLIC ACID 1MG/ML SYRUP IN SUNGAI BULOH HOSPITAL OUTPATIENT PHARMACY DEPARTMENT: A COMPARISON BETWEEN SIMPLE SYRUP OR X-TEMP SUSPENSION AS A SUSPENSION VEHICLE**

Md. Sani R1, Hing YL1, Lee CC1

**Department of Pharmacy, Sungai Buloh Hospital**

**Introduction:** Folic Acid syrup is most commonly prepared by utilizing...
simple syrup (RM 18.50/3.6L) as suspending agent but with short shelf life (14 days). Intralipid is a more expensive suspending agent (RM 50/L) with longer shelf life (60 days). Shorter shelf life of suspending vehicle will lead to frequent refills, increasing workload, and increasing consumption of consumables thereby causing increases in overhead costs. Thus, a cost analysis study conducted to determine which suspending vehicle would offer the lowest overall cost. **Objectives:** To determine the direct cost and indirect cost associated with the use of simple syrup and X-temp as a suspending vehicle to prepare FA syrup, which will both be factored in to estimate the overall cost of dispensed FA syrup. **Methods:** It is a cross-sectional cost analysis study by doing cost calculations based on direct cost (prices of various paraphernalia and personnel labour costs) and indirect cost (lost opportunity cost and training cost). The price of paraphernalia was obtained from Pharmacy Inventory Management and personnel labour to prepare and dispense Folic Acid syrup were calculated based on a time recording form. However, a set of questionnaire was distributed to patients who have been started on Folic Acid syrup using simple syrup then continued with X-TEMP for the next visits in order to obtain indirect costs. **Results:** The frequency of refill is 2 times per month for simple syrup but 1 times per month for X-TEMP. So, the overall cost of making Folic Acid syrup with simple syrup as suspending vehicle is RM 675.12/patient/year which would be approximately 2 times higher than that of X-TEMP which costs RM 358.92/patient/year. **Conclusions:** Folic Acid syrup made by using X-TEMP as suspending agent is more cost saving than simple syrup.

**ABSTRACT #36**
**EVALUATION OF CONTINUOUS INFUSION VANCOMYCIN IN HOSPITAL SUNGAI BULOH: RETROSPECTIVE OBSERVATIONAL, SINGLE-CENTRED COHORT STUDY**

Koh HM’, Ang SY’, Mageespy R’
Department of Pharmacy, Sungai Buloh Hospital’

**Introduction:** Continuous infusion of vancomycin (CIV) is increasingly preferred because it allows for therapeutic levels to be maintained within the safe therapeutic range compared to intermittent vancomycin (IIV). However, CIV requires more constant monitoring and adjustment compared to IIV. An observational study was conducted in Sungai Buloh Hospital. Continuous infusion has been proven to be more predictable and constant serum concentrations, where the target serum level is between 15-25μg/mL was achieved more consistently. In addition, this mode of infusion also found to have lower risk of nephrotoxicity. **Objectives:** This study was designed to evaluate the effectiveness and safety of continuous infusion vancomycin in Sungai Buloh Hospital. **Methods:** This was a retrospective observational, single-centred cohort study, where patients previously given vancomycin continuous infusion were followed through their duration of treatment. Period of study was from October 2010 until October 2013. Proportion of patients attaining desired vancomycin level (15-25μg/mL) and average time taken to reach desired level were obtained. **Results:** A total of 10 patients (3 females & 7 males) with age group between 14-53 years were studied and 80% of them achieved target vancomycin levels of 20-25μg/mL. 10% of patients attained therapeutic level within 24-48 hours. Average time to reach therapeutic level was 6 days. 1 out of 10 patients (10%) developed nephrotoxicity during continuous infusion vancomycin which could also be attributed to concomitant polymyxin use. **Conclusions:** CIV practice is still not well established in Sungai Buloh Hospital. However, patients admitted for the period of 3 years. However, it has shown to be a reliable alternative method for patients with severe MRSA infections who were unable to reach therapeutic levels with IIV. CIV dosing regimens especially those for neurological-related infections need to be improved to achieve target levels faster.

**ABSTRACT #37**
**STUDY ON THE USE OF THE INTRAVENTRUS FISH OIL LIPID EMULSION IN PREMATURE NEONATES REQUIRING PARENTERAL NUTRITION**

Alda MS’, Lee VJ’
Department of Pharmacy, Sungai Buloh Hospital’

**Introduction:** Premature infants possess limited energy and fat reservoir as they have missed the important period of nutrient accretion and storage. The nutritional needs are usually dependent on parenteral nutrition (PN). Intravenous lipid emulsion (ILE) is an essential part of PN regimen in neonates. Traditionally, Intralipid (IV) is the most prevalent pathogen of hospital-acquired infection (HAI). The prospective observational study took place in the medical wards at Hospital Sungai Buloh. Data was collected from all patients started on BSAb, namely Cefepime, Tazocin and Carabepenems, were included within the study period. However, patients whose antibiotics were started in other hospitals, or were transferred to other hospitals, were excluded. **Results:** There were 105 patients started on BSAb for HAI. 98 patients were started empirically. 49.5% were empirically started on cefepime and 29.5% on tazocin, while 20% were prescribed carabepenems based on definitive cultures (n=105). 8% of patients did not have their blood cultures taken. A higher incidence of parenteral nutrition associated liver disease (PNALD) was seen in premature neonates receiving SMOFLipid compared with Intralipid. An increase in ALT level on day 14 vs. baseline was seen in the SMOFLipid group while a significant increase was seen in the Intralipid group. Where, in the SMOFLipid group no incidence of PNALD was reported. **Conclusions:** More than 90% of the patients on empirical BSAb had blood cultures taken within 24 hours of starting antibiotics. However, the most prevalent pathogen of HAI was S. aureus, followed by enterobacteriaceae. Considering cefepime as first line choice for empirical therapy in HAI.
ABSTRACT #40

A SURVEY ON KNOWLEDGE OF ORAL EXTEMPORANEOUS PREPARATIONS AMONGST PHARMACIST AND PHARMACIST'S ASSISTANTS IN HOSPITAL SUNGAI BULOH

Darshini S1, Hon MY1, Nordiyana S1

Department of Pharmacy, Sungai Buloh Hospital

Introduction: Oral extemporaneous preparation is widely used in all hospitals in Malaysia to fulfil patients' needs. Lack of commercially available oral liquid preparations in the market poses a challenge in providing medications to patients. Pharmacists and pharmacist’s assistant are often required to prepare extemporaneous preparation to meet the needs of these patients however, pharmaceutical profile such as stability, efficacy, expiry, taste and many more should be take into consideration before the preparation is carried out. The question then arises if the majority of pharmacy staffs have sufficient knowledge and skills needed in preparing extemporaneous as they are the one who will be responsible in preparing it with accurate concentration and dosages. Objectives: The purpose of this study was to measure the current level of knowledge on oral extemporaneous preparation amongst pharmacists and assistant pharmacists in Hospital Sungai Buloh and to identify the common problems that are frequently encountered when preparing extemporaneous preparations. The data comprise of 92 respondents; 42 pharmacists, 19 provisionally registered pharmacists and 33 assistant pharmacists. The questionnaire was divided into several sections: demography, awareness, extemporaneous knowledge and experience in preparing extemporaneous preparation. 6 questions on general extemporaneous knowledge were used to measure the level of knowledge. The data was analysed using Likert Scale. Results: The data analysis showed the current level of knowledge amongst personnel was good, accounting for 36% from total respondents. Majority of pharmacists had very good level of knowledge; assistant pharmacist had good level of knowledge while provisionally registered pharmacists had fair level of knowledge. Problems encountered when preparing extemporaneous preparations was, they did not know what diluent to use when preparing the preparations. Conclusions: Continuous professional education would be beneficial, especially to the provisionally registered pharmacists in improving their knowledge and skills in oral extemporaneous preparation. This would also shorten the time needed to process and prepare the extemporaneous solutions.

ABSTRACT #41

THE EFFECTS OF PHARMACIST PATIENT EDUCATION ON THE OCCURRENCE OF RETURN MEDICATIONS IN AN INPATIENT SETTING

Chong PF1, Ang ASY1, Belakrishnan N1

Department of Pharmacy, Sungai Buloh Hospital

Introduction: Majority of patients visiting the outpatient pharmacy was, they did not know what diluent to use adverse drug reactions amongst elderly patients. Introduction: Oral extemporaneous preparation is widely used in all hospitals in Malaysia to fulfil patients' needs. Lack of commercially available oral liquid preparations in the market poses a challenge in providing medications to patients. Pharmacists and pharmacist’s assistant are often required to prepare extemporaneous preparation to meet the needs of these patients however, pharmaceutical profile such as stability, efficacy, expiry, taste and many more should be take into consideration before the preparation is carried out. The question then arises if the majority of pharmacy staffs have sufficient knowledge and skills needed in preparing extemporaneous as they are the one who will be responsible in preparing it with accurate concentration and dosages. Objectives: The purpose of this study was to measure the current level of knowledge on oral extemporaneous preparation amongst pharmacists and assistant pharmacists in Hospital Sungai Buloh and to identify the common problems that are frequently encountered when preparing extemporaneous preparations. The data comprise of 92 respondents; 42 pharmacists, 19 provisionally registered pharmacists and 33 assistant pharmacists. The questionnaire was divided into several sections: demography, awareness, extemporaneous knowledge and experience in preparing extemporaneous preparation. 6 questions on general extemporaneous knowledge were used to measure the level of knowledge. The data was analysed using Likert Scale. Results: The data analysis showed the current level of knowledge amongst personnel was good, accounting for 36% from total respondents. Majority of pharmacists had very good level of knowledge; assistant pharmacist had good level of knowledge while provisionally registered pharmacists had fair level of knowledge. Problems encountered when preparing extemporaneous preparations was, they did not know what diluent to use when preparing the preparations. Conclusions: Continuous professional education would be beneficial, especially to the provisionally registered pharmacists in improving their knowledge and skills in oral extemporaneous preparation. This would also shorten the time needed to process and prepare the extemporaneous solutions.

ABSTRACT #42

A SURVEY ON THE PERFORMANCE OF CLINICAL PHARMACISTS BY MEDICAL PROVIDERS IN HOSPITAL SUNGAI BULOH

Chong PF1, Ramalingam M1, Yeow BH1

Department of Pharmacy, Sungai Buloh Hospital

Introduction: Clinical pharmacists are able to offer information on drug management to both patients and the medical team as they are trained in therapeutics. This study was done to evaluate the satisfaction among medical staff on the performance of the clinical pharmacist in HSB.

Objectives: This study is done to evaluate the participation and contribution of clinical pharmacists with the healthcare providers in Hospital Sungai Buloh. To assess the involvement of clinical pharmacists in providing relevant pharmacy-related services to discharges patients/patients’ caretaker/patients’ family and to evaluate the personal skills of clinical pharmacists at a working environment.

Methods: In this cross-sectional questionnaire-based survey, a pilot study was done. 130 questionnaires were distributed in August 2013, and 101 were collected from the HSB medical staffs serving in wards that have a clinical pharmacist, including medical officers, specialists, consultants, nurses and sisters. Participants were randomly selected from the wards, according to the ratio of professions in each ward. Sample size was determined using Altman plotting. For each question, the respondents indicated their degree of satisfaction on a 4-point Likert Scale; very satisfying, moderate satisfactory, not satisfactory, and poor. SPSS software was utilized for descriptive analysis. Results: For participation and contribution of clinical pharmacists, 67.5% are moderately satisfied, 27.1% are very satisfied while only 5.4% are not satisfied. For the provision of services to patients, 65.3% are moderately satisfied, 29.2% are very satisfied, leaving only 1.5% of dissatisfaction. 99.5% of the respondents are at least moderately satisfied with the personal skills. For the overall performance, were at least moderately satisfied at least moderately satisfied. Conclusions: The clinical pharmacists shall provide more CME to medical staffs as there is still space for improvement. Since majority of the respondents were satisfied, the services of clinical pharmacists shall be expanded and continued to wards as well.

ABSTRACT #43

REVIEW OF OFF LABEL PRESCRIBING IN PAEDIATRIC PATIENTS IN HOSPITAL SUNGAI BULOH: A PROSPECTIVE STUDY

Hon MY1, Yew SF1, Shamala B1, Nurul F1

Department of Pharmacy, Sungai Buloh Hospital

Introduction: Off label prescribing of medication is defined as the unauthorized use of a drug for a purpose other than that approved by the authorized organization. Unavailability of suitable registered medicine and lack of clinical trials in paediatrics result in high percentage of off label prescribing in paediatrics. This prospective study is to determine the proportion of off label prescribing in paediatrics in Hospital Sungai Buloh (HSB). Objectives: The objectives of this study are to identify the classes of medication associated with off label prescribing among paediatric patients; to identify the most common medications frequently prescribed as off label medication and to document the common types of off label prescribing. Methods: Data was collected from all paediatric patients admitted into paediatric wards of HSB for over 4 weeks. Paediatric patients under Dental observation or in intermediate and conva of Neonatal Intensive Care Unit were not included. Data collected included patient identification number, age, gender, race, diagnosis and details of all drugs administered. All data obtained was analysed using Microsoft Office Excel 2007. Results: A total of 461 patients (male 275, female 186) were admitted, 1,427 medicines prescribed. 81% of medicines prescribed were listed in Ministry of Health (MOH) Formulary and 19% were used off label (17% listed in MOH Formulary for other indications, dose, frequency or permissible age while 2% were not listed in MOH Formulary). Off label dosing (28%), age (27%), and extemporaneous preparations (18%) accounted for the most common types of off label prescribing. Antibiotics (such as amoxicillin+clavulanate and benzylpenicillin) prescribing were the main drug class that were prescribed off label. Conclusions: Out of 1,427 prescriptions, 19% prescribed medicines in the paediatric wards were off labelled. Safety and efficacy data should be obtained for children to determine whether these medicines used as off-label are warranted or safe.

ABSTRACT #44

KNOWLEDGE, ATTITUDES AND PRACTICE TOWARD DRG SYSTEM AMONG TURKISH HEALTH CARE PROVIDERS

Gazi University, Ankara; Health Technology Assessment Unit (ANHTA), Ankara Numune Training and Research Hospital, Ankara, Turkey

Objectives: The objectives of this study are to identify the classes of medication associated with off label prescribing among paediatric patients; to identify the most common medications frequently prescribed as off label medication and to document the common types of off label prescribing. Methods: Data was collected from all paediatric patients admitted into paediatric wards of HSB for over 4 weeks. Paediatric patients under Dental observation or in intermediate and conva of Neonatal Intensive Care Unit were not included. Data collected included patient identification number, age, gender, race, diagnosis and details of all drugs administered. All data obtained was analysed using Microsoft Office Excel 2007. Results: A total of 461 patients (male 275, female 186) were admitted, 1,427 medicines prescribed. 81% of medicines prescribed were listed in Ministry of Health (MOH) Formulary and 19% were used off label (17% listed in MOH Formulary for other indications, dose, frequency or permissible age while 2% were not listed in MOH Formulary). Off label dosing (28%), age (27%), and extemporaneous preparations (18%) accounted for the most common types of off label prescribing. Antibiotics (such as amoxicillin+clavulanate and benzylpenicillin) prescribing were the main drug class that were prescribed off label. Conclusions: Out of 1,427 prescriptions, 19% prescribed medicines in the paediatric wards were off labelled. Safety and efficacy data should be obtained for children to determine whether these medicines used as off-label are warranted or safe.
Objective: Diagnosis-related group (DRG) system is patient classification system that allocates and codes similar patients in limited number of cases which are used to compute average cost in cases of cervical cancer, 28,872 deaths from cervical cancer, 282,800 cases of HPV 16/18 related CIN1, 659,3545 cases of CIN2/3, 128,625 cases of HPV 6/11 related CIN1 and 2,480,823 cases of HPV 6/11 related genital warts among women and men over a 100-year period. Vaccination of 13-14 year old females and males (coverage of 89.62%). Results & Conclusions: The current screening and treatment practices with routine vaccination of 13-14 year old females and males (coverage of 89.62%).

ABSTRACT #47
FORMULARY LIST REVIEW OF SULPHONYLURESAS USING MEDICINES SCORING SYSTEM (MEDSS): ANY COST SAVINGS OFFERED?
Ramlia1, Aljunid S.M.1, Sulong S2, Md Yusof F.A.3
United Nations University International Institute for Global Health (UNU-IIGH), Kuala Lumpur, Malaysia1; International Centre for Casemix and Clinical Coding (ITCC), UKM Medical Centre, Kuala Lumpur, Malaysia2; Pharmaceutical Services Division, Ministry of Health, Petaling Jaya, Malaysia3

Objectives: Sulphonylureas are widely used for the management of diabetes. In Malaysia available sulphonylures include glibenclamide, gliclazide, glimepiride and glipizide. Prescription studies are more commonly used at outpatient setting and estimate of direct drug cost. 10 articles were reviewed. Most of the studies were done in developing countries like Saudi Arabia, Pakistan, China, Hong Kong and Malaysia. 8 studies were done in outpatient setting. 1 in inpatient setting and 1 in both inpatient and outpatient setting. 8 studies were done in single hospital and 2 studies were done in a few health facilities. In single hospital, the longest duration of study is 4 years with 12,000 prescriptions collected and the shortest duration of study is 1 month with 1,026 prescriptions collected. In multiple healthcare facilities, a study with total of 2,382 prescriptions collected at 10 facilities in 1 day and a study with total 3,769 prescriptions collected at 5 facilities in 3 months. The average number of drugs per prescription is 1.9 at outpatient setting and 7.2 at inpatient setting. The direct drug cost is calculated from the unit cost obtained from Hospital Drug Formulary and unit price charged by dispensing chemist in hospital. Conclusion: The cost reducing strategies are more commonly used at outpatient setting due to the monitoring of drug utilization in chronic condition like diabetes and hypertension. It is also used in specialist clinics to monitor the specific drug use in specific group of patients like paediatric and pregnant women. Prescription studies were mostly done in developing countries due to the availability of the prescription data. The direct drug cost is normally calculated from the unit cost by respective hospital procurement.

ABSTRACT #48
OUTCOME STATUS AND DURATION OF DUAL ANTIPATELET USE AMONG POST-PIC-PATIENTS
Azmi S1, Abdul Aziz SH1, Wan Azman WA2, Sim KH1
Azmi Burhani Consulting1; Department of Medicine, Universiti Malaya Medical Centre2; National Heart Association Malaysia3

Objective: To compare patient outcomes based on duration of dual antiplatelet use following percutaneous coronary intervention (PCI).
Methods: The National Heart Association Malaysia collects and reports data on patients undergoing PCI's in the NCVD-PCI registry. The NCVD-PCI registry database was analysed to assess the outcomes of interest. Patients with PCI procedures performed between 2010-2012 and received dual antiplatelet therapy (DAPT) at time of discharge were selected. DAPT was defined as combination of aspirin and clopidogrel or ticlopidine. We then calculated patient dual antiplatelet use at 30-days, 6-months and 1-year follow-up. Descriptive analysis was performed using stata version 11.2. Results: Between 2010-2012, a total of 11,567 patients received DAPT at discharge following PCI procedure. More than half of patients were male (58.2%). Majority of patients had dyslipidaemia (71.6%) or hypertension (73.1%), while almost half had a diagnosis of diabetes mellitus (45.9%). About 29% of the patients were current smoker. Follow-up data was available for 3,081 patients. The proportion of patients who had died was highest for among those who received the DAPT up to 30-days (3.5%), followed by up to 6-months (2.7%), only at discharge (1.1%) and up to 1-year (0.2%).

Conclusions: Approximately half of post PCI patients who were given
ABSTRACT #49
LENGTH OF STAY AND PROGNOSTIC FACTORS FOR 30- DAY READMISSION FOR POST-PCI PATIENTS WITH DYSLIPIDEMIA, HYPERTENSION AND DIABETES
Azniz Saad, Abdul Aziz Shih, Wan Azman WA, Sim KH3
Azniz Burhani Consulting1, Department of Medicine, Universiti Malaya Medical Centre, National Heart Association Malaysia
Objectives: To describe the differences in length of stay (LOS) and prognostic factors for 30-day readmission for patients undergoing PCI who have dyslipidaemia, hypertension or diabetes mellitus. Methods: The National Heart Association Malaysia collects and reports data on patients undergoing percutaneous coronary intervention (PCI) in the NCVD-PCI registry. We utilized registry data of patients who underwent PCI between 2010-2012, who also had a diagnosis of dyslipidaemia, hypertension or diabetes mellitus and compared their LOS and 30-day readmission rates. Descriptive and regression analyses were performed using STATA version 11.2. Results: In the registry, among patients who had undergone PCI between 2010-2012, there were 9,560 (71.7%) patients with a diagnosis of dyslipidaemia, 9,791 (73.5%) with hypertension and 6,076 (45.6%) with diabetes. The percentage of dyslipidaemic, hypertensive and diabetic patients having 30-day readmission was 3.6%, 3.3% and 3.8%, respectively. Mean LOS was similar for all three conditions, at an average of approximately 5 days. However, different factors influenced the 30-day readmission between these comorbidities. For dyslipidaemic patients, the factors were Killip Class 2 (HR=1.43, p-value=0.019) and intra-aortic balloon pump (IABP) use (HR=0.004). For hypertensive patients, the readmission rate was only affected by Killip Class 2 (HR=1.52, p-value=0.009). For diabetic patients, the prognostic factor was the PCI status of acute myocardial infarction (HR=2.11, p-value=0.010). Conclusions: The LOS for patients with diabetes was higher compared to patients without diabetes. However, different factors were found to influence 30-day readmission rate.

ABSTRACT #50
RELATIONSHIP BETWEEN BELIEFS, ADHERENCE AND QUALITY OF LIFE (QOL) AMONG CHRONIC KIDNEY DISEASE (CKD) PATIENTS ON HAEMODIALYSIS IN PENANG GENERAL HOSPITAL
Said SH, Shafie AA1
Department of Pharmacy, Tumpat Hospital1; School of Pharmaceutical Sciences, Universiti Sains Malaysia
Objectives: The objectives of this study are to assess the relationship between patient’s specific beliefs about medications (necessity and concerns), their adherence level and QOL. Methods: This study was a cross-sectional study among CKD patients on regular haemodialysis in Penang General Hospital. Validated self-administered BMQ specific, MMAS and EQ-5D-3L questionnaires were used in 50 patients. Results: The result from BMQ-specific shows the mean necessity scale (19.6, SD=4.1) outweighs the concerns scale (15.6, SD=4.2) with positive necessity-concerns differential (Means =4.6, SD=5.0). Majority of the participant (82%) had a necessity outweighs the concerns scale. Even though reported means for necessity level was low (n=17) and esomeprazole (n=14) group. Clinical effectiveness was determined by the duration of treatment until bleeding stops and the occurrence of re-bleeding event. The cost included medications, hospitalization, outpatient, medical procedures, imaging and laboratory investigation. The primary outcomes were were cost effectiveness and incremental cost effectiveness ratio for one bleeding-free day and re-bleeding event averted between pantoprazole and esomeprazole. Results: The direct cost per patient for pantoprazole and esomeprazole regimen was RM 4,817.60 and RM 4,745.74. Esomeprazole achieved earlier bleeding-free day (2.07 days vs. 2.3 days), and averted more re-bleeding event (100% vs. 82.35%) than pantoprazole. Esomeprazole dominate over pantoprazole for additional one bleeding free-day re-bleeding event. The sensitivity analysis showed that the cost effectiveness values were most sensitive to shorter duration to achieve bleeding-free day as well as the reduction of blood transfusion cost. Conclusions: Esomeprazole is more cost-effective compared to pantoprazole in the treatment of upper gastrointestinal bleeding.

ABSTRACT #52
VALIDATION OF EQ-5D-5L IN THE GENERAL POPULATION OF MALAYSIA
Shafie AA1, Hassali MA1, Chan CY1
Discipline of Social and Administrative Pharmacy, Universiti Sains Malaysia
Objectives: To determine the validity of EQ-5D-5L in the general population of Malaysia. Methods: A cross sectional study was conducted among the general states of Malaysia using random cluster technique. A total of 31 patients were recruited and randomly assigned into pantoprazole (n=17) and esomeprazole (n=14) group. Clinical effectiveness was determined by the duration of treatment until bleeding stops and the occurrence of re-bleeding event. The cost included medications, hospitalization, outpatient, medical procedures, imaging and laboratory investigation. The primary outcomes were were cost effectiveness and incremental cost effectiveness ratio for one bleeding-free day and re-bleeding event averted between pantoprazole and esomeprazole. Results: The direct cost per patient for pantoprazole and esomeprazole regimen was RM 4,817.60 and RM 4,745.74. Esomeprazole achieved earlier bleeding-free day (2.07 days vs. 2.3 days), and averted more re-bleeding event (100% vs. 82.35%) than pantoprazole. Esomeprazole dominate over pantoprazole for additional one bleeding free-day re-bleeding event. The sensitivity analysis showed that the cost effectiveness values were most sensitive to shorter duration to achieve bleeding-free day as well as the reduction of blood transfusion cost. Conclusions: Esomeprazole is more cost-effective compared to pantoprazole in the treatment of upper gastrointestinal bleeding.

ABSTRACT #53
EXPLORING THE WILLINGNESS TO PAY FOR VOLUNTARY COMMUNITY-BASED HEALTH INSURANCE IN MALAYSIA
Shafie AA1, Hassali MA1, Chan CY1
Discipline of Social and Administrative Pharmacy, Universiti Sains Malaysia
Introduction: Healthcare in Malaysia is funded primarily through taxation (58%) but is no longer sustainable. One funding option is community-based health insurance (CVHI). The purpose of this study is to assess the factors affecting of Malaysian willingness to pay (WTP) for voluntary CVHI. Methods: A cross sectional study was carried out in the Penang between January and September 2014. A total of 250 respondents were involved. The respondents were asked to select their preferred health financing scheme among three (publicly funded, compulsory health insurance and voluntary CVHI) for the WTP for the CVHI scheme was assessed using contingent valuation (CV) method. Results: 54% of the participants were female with mean age of 34 years (SD=11.9). A majority had a monthly income of MYR 2,001-4,000. 63.1% of the respondents indicated their willingness to join and contributed an average of MYR 196.12 per month toward VHI. The odds of those married to choose VCHI rather than total out-of-pocket is 2.95 times greater than those who are not married, adjusting for health insurance, and education level. WTP is positively influenced by ethnicity, education level, household monthly incomes, types of chronic disease and insurance coverage (p<0.05). Conclusions: Most Malaysians are willing join the CVHI and WTP an average of MYR 191.12 (USD 56) per month for the scheme. Their choice of financing scheme is affected by their married status, current health insurance and education level. The amount that they are willing to pay for CVHI is influenced by income, ethnicity and marriage status.

ABSTRACT #54
THE STATE OF HEALTH ECONOMICS RESEARCH IN MALAYSIA
Lim KK, Lim M2
Clinical Research Centre, Malaysia3; Medtronic4
Objectives: Economic studies have immense potential to contribute towards cost-effective delivery of health care services and technology in Malaysia. However, little is known about the state of economic evaluation studies in the country. The aim of the study is to evaluate the characteristics how economic researches are conducted in Malaysia. Methods: A systematic search was conducted in January 2014 using PubMed, Medline and EconLit databases and included in this analysis. Results: The number of publications increased significantly 11.7% loss for relative discriminatory power. Convergence of EQ-5D-5L and EQ-5D-5L with VAS improved slightly with 5L versus 3L except for usual activities. Conclusions: Greater absolute informativity and lower ceiling effect were noted in EQ-5D-5L compared to EQ-5D-3L. EQ-5D-5L better describes various health states and has acceptable convergent valid EQ-VAS.
to identify economic evaluation (including cost analysis) studies related to Malaysia between 01/01/2008 to 31/12/2014. Only original studies published in English peer-reviewed journals addressing a health-related topic in Malaysia were included. Results: Only 30 articles met the inclusion criteria. These studies covered 11 disease areas, most of which were chronic diseases (17) rather than acute disease. Economic evaluation studies (n=13), involved an average of 6 authors per publication, led by local researchers (first authors) (n=20), mostly published after 2010 (n=18). Conclusions: There are only limited conducts of health economics studies in Malaysia. It is imperative to evaluate the quality of these studies and to ensure more and better quality health economics studies in Malaysia to advise evidence-based allocation of resources for health care.

ABSTRACT #55
A STUDY ON DRUG INFORMATION UTILIZATION AND ACCESSIBILITY AT KAJANG HOSPITAL
Sarah Diyana S1, Zaiton K1, Nur Adlina S1, Haizun Athirah I1, Nur Farah A1

Introduction: Despite the importance of drug information resources, there is little knowledge about which are actually used in practice by prescribers. Objectives: To determine the accessibility and utilization of drug information resources among prescribers in Kajang Hospital (HKJ). Methods: A questionnaire survey used consists of 2 sections: 1) Prescribers were needed to indicate drug information resources used from the 23 list of drug information resources 2) Questions pertaining to awareness, utilization, and quality of services provided by Drug Information Service (DIS) Pharmacy Department, HKJ. A check list form was used to audit the availability of drug information resources in all wards and clinics in HKJ. Results: Among 114 prescribers, the top 3 type of drug information resources used were drug information provided by pharmacist (78.9%), formularies (73.7%), and MOH Clinical Practice Guidelines (CPG) (63.2%). The least use type of resources was journal articles. Findings from survey were essentially similar to findings from audits. Audits results showed that drug information resources most frequently available/readily accessible in wards were CPG (72.2%), MIMS (66.7%), and Hospital Drug Formulary (55.5%). Assessment on quality of DIS findings showed that majority of the prescribers (94.8%) indicated that drug information provided by the DIS to be useful and helps them during prescribing process. Conclusions: Although prescribers frequently obtain drug information from tertiary resources they often consult pharmacists for drug information resources. There is a need for training awareness for better use of resources and utilization of drug information resources as the current focus is on evidence-based medicine to ensure safe and effective medical therapy. Since the choice of drug information resources depends on one’s place of employment and its availability there is a need for pharmacists to make efforts to make them easily accessible, up to date and quality drug information resources in all wards and units.

ABSTRACT #56
ANALYSIS OF MEDICATION RETURN UTILIZATION AND ACCESSIBILITY AT KAJANG HOSPITAL
Ping LS1, Syafirah Naemah SH1, Vigayakumaran JR1, Haniza MA1, Sarah Diyana S1, Zaiton K1, Yee LW1

Introduction: Studies show medication return are vital to curb spiralling costs. Medications returned are often attributed to patients’ misunderstanding of their own medication attributed by personal beliefs that medications were unnecessary, ineffective and harmful. Other reasons for excess medications returned were discrepancy between duration of drugs prescribed and the patients’ own medication. Difference in patient’s perception of medications prescribed for same disease indication by more than one prescribers at different institution follow ups, patients’ experienced of unpleasant side effects, medications that are prescribed as a needed/PBRN basis and medication that are not patient’s appointment medications. Purposive sampling was used to recruit patients from healthcare personnel group who have returned medications to Outpatient Pharmacy Kajang Hospital. Two focus group discussion (FGD) sessions were held consisted of 6 participants in each session. Methodology: Information collected was audio recorded, transcription and textual analysis were conducted for FGD. Results: Most of participants stated reasons for excess medications returned was due to treatment changes accounted by medication being stopped and changed in dose/diagnostic prescribed. Some of the participants pointed out reason was due to discontinuation of own medication attributed by personal beliefs that medications were unnecessary, ineffective and harmful. Other reasons for excess medications returned were discrepancy between duration of drugs prescribed and the patients’ own medication. Difference in patient’s perception of medications prescribed for same disease indication by more than one prescribers at different institution follow ups, patients’ experienced of unpleasant side effects, medications that are prescribed as a needed/PBRN basis and medication that are not patient’s appointment medications. Discussion (FGD) sessions were held consisted of 6 participants in each session. Conclusions: To determine further into the reasons and perceptions behind returned medications among patients from healthcare personnel group. Purposive sampling was used to recruit patients from healthcare personnel group who have returned medications to Outpatient Pharmacy Kajang Hospital. Two focus group discussion (FGD) sessions were held consisted of 6 participants in each session. Audio recording, transcription and textual analysis were conducted for FGD. Results: Most of participants stated reasons for excess medications returned was due to treatment changes accounted by medication being stopped and changed in dose/diagnostic prescribed. Some of the participants pointed out reason was due to discontinuation of own medication attributed by personal beliefs that medications were unnecessary, ineffective and harmful. Other reasons for excess medications returned were discrepancy between duration of drugs prescribed and the patients’ own medication. Difference in patient’s perception of medications prescribed for same disease indication by more than one prescribers at different institution follow ups, patients’ experienced of unpleasant side effects, medications that are prescribed as a needed/PBRN basis and medication that are not patient’s appointment medications. However, participants who were treated with tablets only are significantly having a good quality of life in term of physical and psychological health than patients who are treated with insulin with or without OAD.

ABSTRACT #57
INCIDENCE OF HYPERSENSITIVITY REACTION IN HIV-INFECTED PATIENT STARTING NNRTI-CONTAINING REGIME: A CROSS SECTIONAL STUDY ON HTAR PATIENTS
Oon HY1, Amir Hamzah SA1, Abdul Latip WSS1, Wong WW1, Wan Mohd Azam W1

Introduction: To compare the treatment outcome between Esomeprazole versus Pantoprazole in the outpatient surgical department at HTAR. Methodology: This retrospective study included antiretroviral drug-na’ve patients initiated with either EFP or EFP-based HAART that undergone follow up at the Medication Therapy Adherence Clinic (MTAC). This study aimed to determine and compare the incidence of hypersensitivity reactions in HAART-naive HIV patient taking EFP or NVP based regimen, to assess risk factors associated with the hypersensitivity reactions and to study the prescribing trend of NNRTI regimen in HTAR. Results: A total of 112 patients were included in the study, 47 in NVP-based group and 65 in the EFP-based group. Hypersensitivity developed in 11 patients (9.8%) in the NVP-based group. Hypersensitivity developed in 11 patients (9.8%) in the NVP-based group and 2 patients (1.8%) in EFP-based group with a significant p value of 0.001. No significant risk factor could be assessed. Prescribing rate of EFP is higher than NVP in HTAR. Conclusions: Incidence of hypersensitivity in patient initiated with NVP is higher than EFP. No significant risk factor associated with risk of developing hypersensitivity towards NNRTI could be concluded due to limited power of the research. Prescribing rate of EFP is higher than NVP.
pharmacists in HTAR. The result was tabulated using Chi-square Test. Results: This study showed that after 1 month of the therapy, there is no significant difference between Esomeprazole and Pantoprazole in overall symptoms improvement (p>0.05). Esomeprazole has greater improvement compared to Pantoprazole to reduce the abdominal ache or pain before meals, dyspeptic symptoms, duration of nausea, length of time taken to achieve birth weight (in days), presence of TPN-associated osteomalacia and renal impairment. Results: There is no significant difference (p>0.05) in the mean of birth weight and gestational age between the two groups of infants. No significant difference (p>0.05) was observed for time taken to achieve birth weight (in days), length of mechanical ventilation, length of hospital stay, number of episodes of TPN-associated osteomalacia and renal impairment between infants who received TPN with 2.5%w/v amino acid concentration and 2.8%w/v amino acid concentration. However, the duration of parenteral nutrition was shorter and there were less episodes of sepsis in premature infants receiving TPN with amino acid concentration of 2.5%w/v versus 2.8%w/v (p-value<0.05). Conclusions: The small difference of amino acid concentration between the two groups (2.5%w/v versus 2.8%w/v) could be insufficient to cause significant difference in the aforementioned outcomes. However, TPN containing higher amino acid concentration (2.8%w/v) seems to be a better choice of nutrition in premature infants and a further study with a bigger sample size and larger difference in amino acid concentrations should be conducted.

**ABSTRACT #60**

**THE OUTCOME OF HOME MEDICATION REVIEW PROGRAMME IN EMPowering PSYCHIATRIC PATIENTS AT HtAR kLANG**

Anusuya K’, Larry LLS’, Parimala Vi’

Department of Pharmacy, Tengku Ampuan Rahimah Hospital. Klang’

Objectives: To investigate the effect of pharmacist’s involvement under HMR in CPU on the rate of patient’s readmission to psychiatry ward within three months of the last discharge. Methods: 510 patient’s records from 2009 to 2012 were reviewed. Prior to 2011, there was no pharmacist’s involvement in CPU. From 2011 onwards, pharmacist has been actively participating in patient’s care under HMR programme. Results: There were 80 readmissions from 79 patients in 2009 which resulted in 6.3% of readmission rate. In 2010, there were 52 readmissions from the total patient of 120, this contributed to 3.6% of readmission rate. There were 141 patients in 2011 and total readmission was 8 which resulted in 0.47% of readmission rate. In 2012, there were 13 readmissions from 170 patient’s records of readmission rate. It was found that there was a significant reduction in the rate of readmission to psychiatry ward within three months of the last discharge after pharmacist’s involvement in CPU patient care under HMR programme, from 6.3% (2009) and 3.6% (2010) to 0.47% (2011) and 0.63% (2012). Conclusions: This study shows that pharmacist’s involvement in CPU under HMR programme does help to optimise patient’s healthcare and thus reducing the rate of patient readmission into psychiatry ward.

**ABSTRACT #61**

**MEDICATION RECONCILIATION IN HOSPITAL BANTING MEDICAL WARDS: IDENTIFYING THE TYPES AND FACTORS CONTRIBUTING TO MEDICATION DISCREPANCIES**


Department of Pharmacy. Banting Hospital’a

Introduction: Medication reconciliation is a formal process for creating the most complete and accurate list possible of a patient’s current medications and comparing the list to those in the patient record or medication orders. While medication discrepancies are defined as unexplained differences among documented regimens against different sites of care. This aspect has become one of the factor in which attention is required to improve the quality and safety of healthcare. Objectives: To conduct medication reconciliation in patients who admitted to medical wards and to identify types of medication discrepancies and factors contributing to medication discrepancy. Method: A descriptive, cross-sectional study on medication discrepancies amongst patients that are admitted to medical wards of Hospital Banting. Results: The percentage of medication discrepancies obtained of 60 samples was 42.9%, and the types of medication discrepancies commonly occurring in the Medical Wards of Hospital Banting are (1) omission of drug; (2) change in the dose; (3) change in frequency; (4) change of drug; (5) addition of new drug; all in order of the most common to the least common. Conclusions: This study identified the factors that lead to medication discrepancies that commonly occur are either the Patient factor or the System factor. The common factors resulting discrepancies are; non-adherence, unable to tolerate side effects, unneeded prescription, conflicting information and unrecognized cognitive impairment. Medications commonly associated with medication discrepancies are antihypertensives, antihyperglycaemic, antidiyslipidaemia, antiasthmatics, and cardiovascular (in order or most common to the least common).

**ABSTRACT #62**

**CLINICAL OUTCOMES OF PREMATURE INFANTS RECEIVING TOTAL PARENTERAL NUTRITION (TPN) SOLUTION WITH VARYING AMINO ACID CONCENTRATION OF 2.5%W/V VERSUS 2.8%W/V IN NICU, HOSPITAL SELAYANG**


Department of Pharmacy, Hospital Selayang

Objectives: To compare the clinical outcomes of premature infants receiving TPN solution with different amino acid concentrations (2.5%w/v versus 2.8%w/v) in Neonatal Intensive Care Unit (NICU), Hospital Selayang. Design: A retrospective study Setting: Hospital Selayang neonatal intensive care unit. Methods: A total of 151 premature infants were hospitalized but 40 were excluded (28 of them had birth weight more than 1.25kg, 8 of them passed away, 2 of them were transferred out before the end of the study). There were 111 premature infants that were eligible for this study. Conclusions: A total of 111 premature infants were eligible for the study. Electronic medical records were reviewed to obtain the following parameters: gestational age, birth weight, date of commencement and date of ending of total parental nutrition, weight right after meals, weight 4 hours after meals or when hungry at right after meal, duration of time taken to achieve birth weight (in days), presence of TPN-associated osteomalacia and renal impairment. Results: There is no significant difference (p>0.05) in the mean of birth weight and gestational age between the two groups of infants. No significant difference (p>0.05) was observed for time taken to achieve birth weight (in days), length of mechanical ventilation, length of hospital stay, number of episodes of TPN-associated osteomalacia and renal impairment between infants who received TPN with 2.5%w/v amino acid concentration and 2.8%w/v amino acid concentration. However, the duration of parenteral nutrition was shorter and there were less episodes of sepsis in premature infants receiving TPN with amino acid concentration of 2.8%w/v versus 2.5%w/v (p-value<0.05). Conclusions: The small difference of amino acid concentration between the two groups (2.5%w/v versus 2.8%w/v) could be insufficient to cause significant difference in the aforementioned outcomes. However, TPN containing higher amino acid concentration (2.8%w/v) seems to be a better choice of nutrition in premature infants and a further study with a bigger sample size and larger difference in amino acid concentrations should be conducted.
144 surveys were returned. All respondents regardless of specialty were routinely administering enteric coated medications (92.8%), while 97% were crushing sustained-release medications. When medications are due at the same time, respondents will administer medications together through EFC, with the highest number of respondents from Surgical (100%), followed by Cardiac/cardiopulmonary (90.2%). Cardiac/cardiopulmonary (86.7%) and AIC (61.5%) and there is a significant difference among the disciplines (p-value=0.018). Common drugs thought to contribute to catheter obstruction are calcium polyurethane sulfate powder (54.3%) and potassium chloride (13.3%) as catheters encountered per week, catheter obstruction due to medication occurs about 50% of the time. Common complications other than catheter obstruction are aspiration from enteral feeding (26.4%) and tube dislodgement (20.4%). Majority of respondents think they have learned the proper technique (92.8%) and feel confident with their current skills (92.9%). However, 80.4% still prefer more training in this area of practice. 

Conclusions: 86.1% of the total respondents have three or more inappropriate techniques. International guidelines on medication administration through EFC should be adapted and tailored as reference for inappropriate techniques. International guidelines on medication administration through EFC should be adapted and tailored as reference for inappropriate techniques. 

ABSTRACT #65

A STUDY OF PATIENT’S SATISFACTION & ADHERENCE TO MINISTRY OF HEALTH MALAYSIA (MOH) GUIDELINES ON DISPENSING METHADONE IN AGENSI ANTIDADAH KEBANGSAAN (AADK) HULU LANGAT, SELANGOR

Ng SY1, Siti Maryati MR2

Department of Pharmacy, Serdang Hospital

Introduction: Methadone is used as a substitution therapy for opioid dependence patient who abuses heroin and morphine. In October 2005, MOH has produced guidelines on methadone maintenance programme to ensure standardization of methadone therapy delivery. The programme showed a better client’s satisfaction. MOH has produced two guidelines on dispensing and counselling of methadone. Auditing service helps identify areas of clinical care and service delivery that require changes and improvement. Therefore, this study is done to assess the quality of methadone dispensing in our centre. 

Objectives: To assess the quality of methadone dispensing in our centre accord to MOH guidelines and to determine the side effects of methadone. 

Methods: Part I: A cross sectional study was carried out via questionnaire adapted from Client Satisfaction Questionaire-8 items (CSQ-8) from March to May 2013. Two additional questions were added where one of the questions was open ended. The sample population is all patients enrolled in the programme except dropouts (missed attendance more than two weeks) during the data collection period. Part II: An audit has been carried out using a review form via face to face interview. The data obtained was evaluated against the “Garis Panduan Pendidansen Methadone” and “Garis Panduan Kaunseling Methadone” as outlined by the MOH. 

Results: Part I: Out of 60 patients, only 55 patients completed the questionnaire. Majority (96.4%) were satisfied whereas the others (3.6%) were very satisfied. Majority (96.4%) were satisfied whereas the others (3.6%) were very satisfied. Majority (96.4%) were satisfied whereas the others (3.6%) were very satisfied. Majority (96.4%) were satisfied whereas the others (3.6%) were very satisfied. Majority (96.4%) were satisfied whereas the others (3.6%) were very satisfied. In the voluntary open-ended question, 63.8% commented, mostly on the opening hours and take away policy. Part II: A total of 40 subjects were interviewed with their medical records reviewed. The results showed that the dispensing of methadone practiced in our centre was in accordance to MOH’s guidelines. All subjects experienced the side effects of methadone. 

Conclusion: in conclusion, our patients were satisfied with the programme and it is in accordance to the MOH's guidelines.
ABSTRACT #69
A SURVEY ON SELF-MEDICATION BY CAREGIVERS/PARENTS OF PATIENTS WITH PSORIASIS PATIENTS IN HOSPITAL TENGKU AMPUAN RAHIMA
Lee JL, Tahir B, Lim FP
Department of Pharmacy, Tengku Ampuan Rahimah Hospital, Klang
Introduction: Self-medication is defined as obtaining and consuming drugs without the advice of physicians/pharmacists either for diagnosis, prescription or treatment. Tendency to treat children by parents/care givers by means of self-medication has been quantified in several studies from other countries. However, the incidence of this practice in Malaysia has not been reported. Objective: To determine the extent of family self-medication among children admitted to paediatric medical ward in Hospital Tengku Ampuan Rahimah (HTAR). Methods: A cross sectional study was conducted using structured questionnaires which were distributed to parents or caregivers of child admitted to 4 paediatric medical wards in HTAR, between March to June 2013. Results: A total of 390 questionnaires were distributed and all responded. 63.8% have practice self-medication on their children. Common illnesses that prompted self-medication were cough (29.7%), cold or flu (20.9%) and fever (18.5%). 28.7% of respondents were confident in self-medicating their child. Majority of the surveyed parents viewed that pharmacists has high level of professionalism on medication (81.6%) and they agreed that pharmacists should advise on medication (89%). Race, age of child, education level and income of caregivers do not predict the practice of self-medication in children by care givers. Conclusions: Self-medication is common among the care givers of paediatric patients in HTAR, which largely involved management of minor ailments.

ABSTRACT #70
MEASURING CHILDHOOD OBESITY BASED ON THREE DIFFERENT APPROACHES: WHO, CDC AND IOTF CRITERIA
Dastani F, Delce ME
Izmir University of Economics, Turkey
Objectives: This study compares body mass index (BMI) and childhood obesity ratios by using three different cut-points based on growth curves generated by World Health Organization (WHO), International Obesity Task Force (IOTF), and the US Centers for Disease Control (CDC). Methods: Prevalence estimates are calculated by using these three BMI cut-points. Estimation data from 1,271 school children (659 females and 612 males) that are between 8 and 17 years old from different schools in city of Izmir, Turkey. Heights, weights, socio-economic and demographic information of children are also measured. Results: Prevalence estimate of childhood obesity is much higher with WHO criteria (8.8%) than with CDC (4.7%) or with IOTF (1.8%). Prevalence estimates of childhood overweight/obesity are similar based on CDC (15.6%) and IOTF (15.3%), but higher when based on WHO criteria (21.1%). Conclusions: Prevalence estimates of childhood obesity and other BMI categories change considerably when different cut-points are employed. This may result in variations in prevalence of childhood obesity estimates in the literature, thus it is necessary to establish a generally accepted standardization in cut-points to determine BMI categories.

ABSTRACT #71
TO EVALUATE THE EFFECTIVENESS OF MEDICATION THERAPY ADHERENCE CLINIC (MTAC) IN PSORIASIS PATIENTS IN SELAYANG HOSPITAL
Ng HW, Khairul Syazwani A, Chee YY, Teo KW, Nik Nur Shairah A, Zukifli AH, Low EH
Department of Pharmacy, Selayang Hospital
Introduction: Psoriasis is a chronic skin disorder which affects approximately 3% of Malaysians which i.e. 400,000. Psoriasis has a profound negative impact on patients' quality of life. Medication Therapy Adherence Clinic (MTAC) psoriasis is an intervention where the pharmacist has high level of professionalism on medication (81.6%) and they agreed that pharmacists should advise on medication (89%). Race, age of child, education level and income of caregivers do not predict the practice of self-medication in children by care givers. Conclusions: Self-medication is common among the care givers of paediatric patients in HTAR, which largely involved management of minor ailments.

ABSTRACT #72
STRUCTURED INTERVENTION FOR ACUTE LOW BACK PAIN IN PRIMARY CARE: A RANDOMISED CONTROLLED TRIAL STUDY
Aziz NA, Syahnaz MH, Muhammad Ifan YAU, Shamsul AS
Department of Family Medicine, Faculty of Medicine, UKM Medical Centre; Family Medicine Specialist, Klinik Kesihatan Tempatan, Semenyih; Department of Community Medicine, Faculty of Medicine, UKM Medical Centre
Background: Acute low back pain is a common complaint, imposing a huge cost in medical care. Back exercise program which was also known as “Back School” program was developed since 1969 for treatment of low back pain. Objectives: To assess the effectiveness of structured back exercise program as a treatment for acute low back pain, in comparison with the standard care alone in terms of pain improvement and changes in functional status in primary care setting. Methods: This was open-labelled randomized clinical trial conducted at a primary care clinic. A total of 90 patients who met the study criteria were randomized into two groups. 45 patients in the intervention group received both standard care of treatment followed with a structured back exercise program. The remaining 45 patients in the control group received standard care of treatment alone which were analgesics and advice on back pain. The patients were followed until eight weeks. Outcomes: The main outcomes were the mean pain score by using Oswestry Disability Index Questionnaire (VAS) and Oswestry Disability Index Questionnaire (ODQ) between intervention and the control group at baseline and after eight weeks. Results: Using per protocol analysis, in both groups, Visual Analogue Score (VAS) and Oswestry Disability Index Questionnaire (ODQ) were significantly reduced after eight weeks duration (p<0.05), but the difference between the control and intervention group post study was not significant. Conclusions: The addition of structured back exercise program in intervention group in patient with acute non-specific low back pain do not show significant improvement in pain score and functional status compared to standard care of treatment alone. Keywords: Back School program, back exercise program, acute low back pain, Oswestry Disability Index

ABSTRACT #73
A RETROSPECTIVE ANALYSIS OF MEDICATION POSSESSION RATIO IN PREDICTING VIROLOGIC OUTCOMES AMONG HIV-INFECTED ADULTS ON SECOND LINE ANTIRETROVIRAL THERAPY IN SUNGAI BULOH HOSPITAL (HSB)
Raghavan P, ‘Kok KL’, Mak WY
Department of Pharmacy, Sungai Buloh Hospital
Introduction: Adherence to ART is a predictor of virologic suppression, emergence of HIV drug resistance, disease progression and death. Monitoring of adherence is often necessary to identify patients at risk of poor clinical outcomes. One of the widely used measures to assess medication adherence is medication possession ratio (MPR). Objectives: The aim of this study is to determine whether MPR can be a predictor of viral load outcome among patients who had failed first line ART. Methods: We conducted a cross sectional study by collecting data from Sungai Buloh Hospital (HSB) computer prescribing system (eHIS) dated from 2008-2013. MPR was defined as the days of medications dispensed divided by the number of days between the first and last prescription refill. Association between MPR and viral load outcome was then determined by cross tabulation of results. Results: MPR was determined for a total of 76 patients. Mean duration of prescription days was 155 days. Mean and mean MPR was 85.81% and 74.40% respectively. Viral load of all 76 patients were not suppressed. Results showed that more than half of them (69.8%) had poor and suboptimal MPR. This implied that most of the patients who had failed first line therapy had poor or suboptimal MPR. Conclusions: This study proved that MPR can be one of the predictors of virologic outcome in patients on ART. Hence it can be a supporting tool to identify patients at risk of suboptimal adherence. Although not definite, it can be incorporated as one of the measures to determine HIV patients' medication adherence in SB.
ADRIAN GOH

A
drian has over a decade of experience in health economics and outcomes research and is currently a health economist at Azmi Buthani Consulting. He has previously worked as a researcher for the Clinical Research Centre of the Ministry of Health, Malaysia and has consulted for the World Health Organisation and the Ministry of Health, where he was appointed to the technical committee to develop the Malaysian pharmacoeconomic guidelines. He studied economics at University, Australia and the National University of Malaysia. He has published scientific papers in the areas of cost-effectiveness analysis, health registry data, and estimation of health utility tariffs using modelling approaches. His recent work has centred on building cost-effectiveness decision models and the adaptation of global cost effectiveness models to local and regional settings.

DR AMRIZAL MUHAMMAD NUR

Dr Amrizal Muhammad Nur is a Research Fellow, United Nation University-International Institute for Global Health (UNU-IIGH). He obtained his MD from Faculty of Medicine Andalas University of Indonesia in 1993, and continuing Master Program (MSC) in Medical Science (Health Care Service Management) at School of Medicine Universiti Sains Malaysia in 2002 and PhD in Public Health (Casemix Management & Health Economics) from National University of Malaysia Kuala Lumpur in 2007. He started his housemanship at Mohammad Jamil Hospital (Provincial & Teaching Government Hospital), Padang (West Sumatera), and later as Deputy Director of Muara Labuh Hospital (District Government Hospital) in West Sumatera Indonesia (1994-1997). He has worked as a Casemix Coordinator in Casemix Unit Hospital Kebangsaaan Malaysia for 9 years (2002-2010). He also appointed as a Medical Lecturer and Casemix Consultant in International Centre for Casemix and Clinical Coding (ITCC) National University of Malaysia from April 2008 till November 2010. From 1st December 2010 until now, he has been appointed as a Research Fellow at UNU-IIGH Kuala Lumpur to conduct research & capacity building on Accessibility, Efficiency and Quality of Care in Health System (especially in casemix management) to support casemix implementation in developing country. His main interest is to assist developing countries in casemix management implementation (especially in patient data analysis, costing data analysis) and cost analysis in Health Care System through research and development in health economics and financing. He is currently involves in supporting a number of developing countries to develop and implement casemix management, a health management and information tool to enhance quality and efficiency of healthcare services provided under Social Health Insurance programmes. He works together with Prof Syed Mohamed Aljunid on casemix system in UNU-IIGH covers research and capacity building programmes in Malaysia, Indonesia, Philippines, Uruguay, Yemen, Kenya, United Arab Emirates, Vietnam and Ghana. He is the one of the Co-Developer and owner of the patents for casemix groupers United Nation Case Based Groups (UNU-CBGs), Malaysian DRGs (MY-DRGs) , and Clinical Costing Modelling Software (CCM) for patient level costing

Currently he appointed as the Casemix Consultant to Philippine Health Insurance to develop Philippine DRG Tariff for Philhealth Reimbursement, Consortium of Private Hospital (FEMI) Uruguay to develop Uruguay DRG Tariff for reimbursement and Centre of Financing and Social Health Security MOH Indonesia (Jamkesmas) to develop INA-CBGs Tariff for Jamkesmas Reimbursement. He has published and co-author several articles in journals and presented in conferences in areas of health economics and public health in general.
ASSOCIATE PROFESSOR ASRUL AKMAL SHAFIE

Asrul A Shafie is a registered pharmacist in Malaysia since 2001 and completed his PhD degree in pharmacoconomics in Cardiff University, UK in 2007. His research interests are in the application of economic evaluation in pharmaceutical services and product, and pharmacy practice. He is now leading and co-investigating a number of researches in pharmacy practice, PRO instrument validation and valuation, and health technology assessment where he has published more than 200 peer reviewed journal articles/abstracts in various international journals including Value in Health, Social Science & Medicine, Quality of Life Research, BMC Public Health and Pharmacoeconomics, and six books/monographs. He regularly reviewed manuscripts for international and local publications including British Medical Journal, Bulletin WHO and Value in Health. He was invited to speak in more than fifty international and domestic scientific events in UK, US, South Korea, Indonesia, Japan, China, Thailand and Singapore. He is also an appointed expert member for the UK National Institute for Health Research Committee, Malaysia Health Technology Assessment Agency (MaHTAS), Malaysia Pharmacoeconomic Guidelines Development Committee, Malaysia National Medicine Policy Steering Committee, Ministry of Health’s Quality Use of Medicine Committee, Malaysia Health Promotion Board, Institute of Health Service Research, Malaysia Pharmacy Advisory Board and Malaysia Pharmacoeconomic Technical Committee. He plays an active and vital role in professional societies and served as the Chair-Elect for ISPOR Good Outcomes Research Practices & Publications Committee, Co-editor for ISPOR News Across Asia, Board Member for HTAsiaLink Network and former Chairman for Malaysian Pharmaceutical Society (Penang Branch). In 2010, he was awarded the prestigious International Fellowship for International Society of Pharmacoeconomics and Outcomes Research. At present, Dr Asrul is an Associate Professor and Chairman in social and administrative pharmacy in Universiti Sains Malaysia, where he teaches pharmacoeconomic, statistic and epidemiology to both undergraduates and postgraduates in the university and four other local institutions.

DR CAROL BAO

Carol Bao is a Director of Global Health Economics and Outcomes Research at AbbVie in the greater Chicago area in the U.S., leading the international team for immunology supporting HUMIRA all indications. She joined Abbott, now AbbVie, in April 2008 as a manager and in the last 6 years, she changed her roles from dermatology lead, to the lead in Cross Indication Strategic Initiatives and later to the global lead for HUMIRA rheumatology, before her current role. Aside from industry experience, Carol spent one year in the greater Boston area as a senior scientist with Abt Associates, Inc., now part of the United Biosource Corporation. She has worked extensively on projects spanning across clinical trial data and administrative claims data base analyses, cost-effectiveness and budget impact models, patient/physician surveys, retrospective chart review studies and value dossiers. Carol holds her doctoral and master degree in Economics from the University of Illinois at Chicago and has a bachelor degree in Economics from Fudan University in Shanghai, China. She was born and raised in Shanghai, China and now lives in the greater Chicago area with her husband and two daughters.

PROFESSOR CHAIYAKUNAPRUK

Professor Chaiyakunapruk joined Monash University as a Professor of Health Economics. He earned his bachelor in Pharmaceutical Sciences from Chulalongkorn University and Doctor of Pharmacy (Pharm.D.) from the University of Wisconsin-Madison. He completed his Ph.D. in Pharmaceutical Outcomes Research and Policy Program from the University of Washington in Seattle, USA. He is best known for his research expertise in systematic review and meta-analysis, health economics, and pharmacoepidemiology/outcomes research. He has more than 50 international publications. He has applied his expertise in a wide range of research topics in pharmacy, medicine, and public health. Dr.Chaiyakunapruk has been very active at both national and international levels. He was a co-founder of the ISPOR Asia Consortium (International Society of Pharmacoeconomics and Outcomes Research), ISPOR Thailand Chapter, and Asia Pacific Evidence-based Medicine Network. He currently serves as an education chair of ISPOR Asia consortium and an executive member and a scientific committee member for ISPOR Asia-Pacific meetings. He is also a member of Health economic board of National Essential Drug List Selection Committee, Signal Detection Committee of Thai FDA, Pharmacy Network in Tobacco Control Committee, and advisory board of Research and Development Institute of Governmental Pharmaceutical Organization. He is also a co-author of Thai Health Technology Assessment Guideline. He has also been working as a consultant for WHO in vaccine-related health economics, malaria control, and pharmaceutical economics. He has also published numerous articles in peer-reviewed medical, public health, pharmacy, and economics journals including Annals of Internal Medicine, Chest. Clinical Infectious Disease, JAMA Dermatology, Journal of Thrombosis and Haemostasis, Drug Safety, Tobacco Control, value in health, and Pharmacoepidemiology and Drug Safety. Dr Chaiyakunapruk also serves as a co-editor of Value in Health Regional issue, a member of an editorial board of Journal of Medical Economics and receives for several prestigious international journals such as the British Medical Journal, JAMA, Annals of Internal Medicine, Vaccine, Value in Health, International Journal of Pharmacy Practice, and Pharmacotherapy. As part of the recognition, he has received several research awards. They include William Rutala Award for his antiseptic research work in year 2001, Nagai Research Award in year 2006, 2009, 2011, Distinguished Research Award of Naresuan University in year 2007, 2008, 2009, 2011 Distinguished Routine to Research Award in year 2008, Best research in community pharmacy award in year 2011, best presentation at Society of Medical Decision Making –Asia Pacific conference in 2014

CHRISTOPH GLAETZER

More than 18 years global experience in the development and implementation of pharmaceutical market access strategies

Responsoble for various commercial and market access related functions in Europe, US and Asia Pacific

International thought leader and speaker on Pharmaceutical Market Access aspects

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Currently Vice President Market Access Asia Pacific responsible for access and pricing strategies for all pharmaceutical products

Last position before moving to AP in 2011 Head of Global Pricing

Co-designer of the Janssen Access Framework

Champion of the Janssen Equity Based Tiered Pricing Strategy

Educational background: Economist, Trained Health Economist and Black Belt Negotiator
DR FEISUL IDZWAN MUSTAPHA

Dr. Feisul Idzwan Mustapha graduated with an MBBS degree from the University of Newcastle-upon-Tyne, United Kingdom in 1997. He subsequently obtained an MPH in Epidemiology and Biostatistics from the National University of Malaysia in 2006. He was inducted as a member of the Academy of Medicine, Malaysia, in 2008. He joined the Disease Control Division (Non-Communicable Diseases Sector), Ministry of Health, Putrajaya as a Public Health Specialist in 2006, where he is currently engaged in the practice of public health in the prevention and control of non-communicable diseases (NCD), with special focus on diabetes and obesity. He led the development of the “National Strategic Plan for Non-Communicable Diseases” (NSP-NCD), which was launched in December 2010. NSP-NCD now provides the framework for Malaysia’s response to the increasing burden of NCD in the country. Specifically for improving the quality of care of diabetes at the primary care level, he led the development of the National Diabetes Registry (or NDR), a web-based application, which went live on 1 January 2011. In addition to being a disease registry, NDR supports the implementation of the “Diabetes Clinical Audit” and the new Diabetes Quality Assurance (QA) Programme for MOH Health Clinics entitled “Quality of Diabetes Care at MOH Healthcare Facilities: Glycaemic Control”, both of which were implemented nationally in 2009. He represents Malaysia at various international meetings, conferences and workshops relating to the prevention and control of NCD, and has also been invited by the World Health Organisation as a temporary advisor for their technical meetings. In addition, he is currently involved in several studies relating to diabetes and obesity in Malaysia, providing expertise in epidemiology and biostatistics. He was chair of the Technical Working Group for NCD risk factors in the recent 2011 National Health and Morbidity Survey (NHMS).

DR GOH BAK LEONG

Dr Goh Bak Leong is the Head and Senior Consultant Nephrologist in Serdang Hospital. He became a member of the Royal College of Physicians in United Kingdom MRCP (UK) in 1996. He obtained his further training as Renal Fellow at Monash Medical School, Alfred Hospital. He was awarded the Fellowship of Royal College of Physicians and Surgeons of Glasgow in 2002. Dr Goh has published numerous original articles in the international peer review journals in the field of general nephrology, dialysis and transplantation. He has special interest in CAPD. He has published great quantity of PD access related articles in Seminars in Dialysis and Peritoneal Dialysis International. He has presented great number of scientific papers in international meetings and congresses. He is a member of many Registries, and Clinical Practice Guidelines. He also sits in many panel / committee / advisory boards as well as professional societies at both national and international level.

DR JASMINE RAOH-FANG PWU

Dr. Pwu obtained her PhD from College of Public Health, National Taiwan University; and the subject of her dissertation was the application of cost-effective analysis using examples from vaccine and anti-viral treatments. Trained as an epidemiologist, Dr. Pwu has been an expert in both observational research and large database analysis. She later became interested in economic evaluations, especially modelling studies. In this area, she has nearly 20 years of research experience. Dr. Pwu is currently Director of the Health Technology Assessment Division for the Center for Drug Evaluation in Taiwan. Her division (CDE/HTA) works closely with the Bureau of National Health Insurance for reimbursement and pricing decisions. Her experiences has led to her participation in several research projects designed to aid health policy decision-making in areas such as anti-HBV treatment, cervical cancer screening and HPV vaccination. Prior to CDE, she worked as a consultant, for both government and industry, conducting economic evaluation studies. Dr. Pwu is also an adjunct Assistant Professor at the Taipei Medical University.

PROFESSOR DATUK DR JEYAINDRAN SINNADURAI

Datuk Dr. Jeya graduated from the National University of Malaysia (UKM) in 1981 and initially worked at the Kuala Lumpur General Hospital and later worked at the Klang General Hospital. Over the years, he has had extensive working experience and postgraduate training at major hospitals in New York, Singapore, London and Dublin. Datuk Dr. Jeya has earned great distinction for research in the fields of Critical Care with an emphasis in both Pulmonology and Cardiology, both of which he has a strong interest. In 1990, in recognition of his contributions to the field of Respiratory Medicine, Datuk Dr. Jeya was awarded the "British High Commissioner's- Chevening Award" to pursue a postgraduate course in Thoracic Medicine at the Royal Brompton National Heart and Lung Institute London. He completed his course in 1991 and became the first Asian to be recognized as international expert and opinion leader in these fields, he has been invited to chair local and international meeting both locally and overseas. Datuk Dr. Jeya also serves as a member of several committees of the Ministry of Health. He is also a member of the committee which was responsible for the development and implementation of Clinical Practices and has an interest in better management of patients. In this respect he is a strong advocate of Clinical Governance and Patient safety. Datuk Dr. Jeya is currently a Senior Consultant Pulmonary and Critical Care Physician and with effect from 1st March 2013 was appointed as the Deputy Director General of Health (Medical) of the Ministry of Health, Malaysia. Datuk Dr. Jeya is also a Fellow of the American College of Chest Physicians, Fellow of the Royal Academy of Medicine Ireland, Fellow of the Royal College of Physicians of Ireland, Fellow of the Faculty of Occupational Medicine, Ireland. He also part of the teaching faculty of the Universiti Kebangsaan Malaysia, Universiti Putra Malaysia and MAHSA. He serves The Royal College of Physicians of Ireland as The Dean of Examinations –Malaysia, Examiner – Clinical Examinations, The Regional advisor to the Royal College of Physicians of Ireland and The American College of Chest Physicians. He is also a Member of the Global Initiative in Asthma (GINA) advisory council which advises the WHO on the current treatment and management of asthma. Member of the WHO Consultation Panel for the Development of a Comprehensive Approach for the Global Prevention and Control of Chronic Respiratory Diseases and Member of the WHO working group on Dengue.
PROFESSOR KENNETH KC LEE

Kenneth Lee is Professor of Pharmacy and Head of Pharmacy Discipline, Monash University, Malaysia. Before he moved to Malaysia, he was Professor and Associate Director (External Affairs) of the Chinese University of Hong Kong (CUHK) School of Pharmacy where he was one of the founding members and had substantially worked for 18 years. He was appointed as a Justice of the Peace by the government of Hong Kong in 2003 for his services to the community. Prof Lee received his pharmacy undergraduate training from the University of Washington in Seattle. His subsequent higher qualifications were from the CUHK and the University of Oxford, UK. He is widely recognised as one of the pioneers in pharmacoconomics and outcomes research in Asia focusing on comparative effectiveness research, health technology assessment and healthcare policy development. He has published extensively in peer-reviewed international journals and has been an author/editor of several textbook chapters. He has been the Editor-in-chief of the Journal of Medical Economics since 2006 and is serving on the editorial board of a number of international journals including Value in Health. He served as Adjunct Professor of School of Pharmacy, the CUHK, and Honorary Professor of School of Public Health, the University of Hong Kong from 2010-13. From 2008-11, he was also appointed as visiting Professor of University of London School of Pharmacy. He has been recently appointed as the Chairman of the Scientific Advisory Committee of the Malaysian Medicinal and Aromatic Plants (MyMAP) project, a collaborative project between Monash University and the Prime Minister’s Office of Malaysia. Prof Lee has served in a number of positions in the International Society for Pharmacoconomics and Outcomes Research (ISPOR). He was the major driving force and later a founding member of the first ISPOR regional consortium - ISPOR Asia Consortium which was established in 2004. He served as president of the Consortium from 2006-8. Before this, he also spearheaded and became the founding chair of the first ISPOR local chapter in Asia – ISPOR Hong Kong Chapter in 1999. He had been a member of the organizing committee of several ISPOR Asia Pacific Conferences from 2004-11. He had also taught in a number of ISPOR short courses. Currently he is one of the co-editors of Value in Health Regional Issue, an official publication of ISPOR. In May 2012, he was elected as a member of the ISPOR Board of Directors for 2012-4.

DR MD KHADZIR BIN SHEIKH HJ AHMAD

Dr. Md Khadzir is a certified Occupational Health Physician and received MD degree from National University of Malaysia, Master degree in Occupational Medicine from National University of Singapore and PhD degree in Occupational Health from The University of Birmingham, UK. He had been drafting Health Laws; Medical Ethics and instrumental in initiating the Traditional and Complementary Medicine Services in the pioneer Hospital Kepala Batas, Hospital Putrajaya and Hospital Sultan Ismail. The program includes registration of Traditional and Complementary medicine practitioner in Malaysia. Currently since late 2008, he is heading the development and operation of electronic Health Information and Management System and the development of Health Informatics Standards for Malaysia. He is now leading the development of Malaysian Health Data Warehouse Project, Acquiring and development of POE of SNOMED CT for implementation in Ministry of Health Hospitals; Development of Malaysian Health Data Dictionary; and development and rolling out of Web Based version of Medical Care Information System that collect granular data for discharges of inpatient and those attending Day Care Services. He is also involved in the implementation of Hospital Information System and Malaysia Health Information Exchange.

MENDEL GROBLER

Mendel Grobler is the Director, Access and Public Affairs at Pfizer Australia (Pty Ltd) and is responsible for reimbursement strategy and public affairs for the company’s products in Australia and New Zealand, as well as advising Pfizer Inc. on regional and global approaches to Health Technology Assessment. He has been working in the field of health care funding and financing for more than twenty years and also has extensive experience across the pharmaceutical industry including manufacture, product development, registration, distribution and community/hospital pharmacy. He has previously represented the industry on the Economic Sub-Committee of the Pharmaceutical Benefits Advisory Committee (PBAC) and also served as advisor to the Australian Department of Veterans’ Affairs. Over the past few years he has accepted invitations to contribute to various government- industry discussions about equitable funding policy in Korea, China and Taiwan. He has published a number of research papers in peer-reviewed and other journals, and delivered presentations at international medical and health economic conferences. He is a member of the Australian Health Economics Society, the International Health Economics Association and Health Technology Association International. Mendel was recently awarded the 2012 Pat Clear Award, Medicines Australia's most prestigious honour. The award is presented annually to recognise an outstanding level of commitment by an individual, group or team for the benefit of the Australian medicines industry.

NOORMAH MOHD DARUS

Noormah Mohd Darus is currently the Senior Principal Assistant Director working at the Malaysian Health Technology Assessment Section, Medical Development Division, and Ministry of Health Malaysia (MOH). She has 32 years of experience in many areas such as health technology assessment, evidence-based medicine, evidence-based healthcare, public health research, pharmacy services and health outcomes research. Currently her work is focused on systematic reviews and she is involved in producing HTA reports, technology assessment reviews for the Ministry of Health and training of MOH personal / University post graduate students on evidence based medicine. Prior to this position, she had vast experiences as a pharmacist and researcher at several MOH institutions such as Sungai Buloh Hospital, National Pharmaceutical Bureau, Kuala Lumpur Hospital, Clinical Research Centre, and Institute for Medical Research. She is also actively involved in creating awareness amongst the healthcare professionals on evidence-based medicine and health technology assessment. She holds a degree on Bachelor of Pharmaceutical Sciences (medical doctor) from Mansourah University (Egypt)and Masters of Science in Clinical Epidemiology from Erasmus University, Rotterdam, Netherlands (Holland).
DR. RAMLI ZAINAL

Dr. Ramli Zainal is currently the Head of Healthcare Financing and Economic Research Division at the Institute for Health Systems Research (IHSR). He graduated from Universiti Sains Malaysia (USM) in Pharmacy and completed a Masters degree from University of Bradford. He then returned to USM and was awarded a PhD degree in Pharmacoeconomics. As a researcher, Dr. Ramli Zainal is the principle investigator for projects funded by UNDP and the National Institute of Health. He also collaborates in various projects and currently actively involved in conducting trainings in the field of economics evaluation in healthcare. He is an expert member to the Ministry of Health Malaysia, Pharmacoeconomics Technical Working Group, Health Technology Assessment group and is an appointed member of the Pharmacy Board Malaysia. He has served the World Health Organisation (WHO) as a consultant for the Training of Trainer in QA/QI in Papua New Guinea and the Pacific Islands. He is also involved in the training for QA/QI at national level and for countries within the WHO Western Pacific Regional Office. Prior to joining IHSR, he had served and held various positions in the National Pharmaceutical Control Bureau as a GMP Auditor, Head of Cosmetic Unit, Head of Secretariat Unit and Head of Organisational Development & IT Division. He has also worked as a Drug Enforcement Officer in Penang and as a Hospital Pharmacist in Gerik and Seremban. He is currently the Secretary to the Malaysian Society for Pharmacoeconomics and Outcomes Research (MySPOR) and a member of the Malaysian Pharmaceutical Society (MPS).

DR. SALMAH BAHRI

Dr. Salmah Binti Bahri graduated with a B.Sc in Pharmacy from the University of Baghdad, Republic of Iraq in 1981. She continued her advanced degree studies in 2001 and received her M.Sc (Pharmacy) and Ph.D in Drug Policy and Management from the Universiti Sains Malaysia in 2002 and 2007 respectively. Her areas of expertise include Medicines Policy and Management, Quality Use of Medicines, Medicines Pricing and Good Governance in Medicines. She is currently the Director of Pharmacy Practice & Development, Pharmaceutical Services Division, Ministry of Health Malaysia (MOH). She leads the strategic planning, implementation and the development of the pharmacy practice activities in Malaysia. She is also the National Pharmacy Research & Development Committee, MOH and chairman of various committees such as, Implementation Committee for Comprehensive National Project on the Quality Use of Medicines by Consumers, Implementation Committee for Good Governance in Medicines, Advisory Group for the Medicine Price Monitoring Program in Malaysia, and Technical Committee for Implementation of National Drug Policy. In addition, she is a member of the Malaysian Board of Pharmacy, Malaysian Drug Control Authority and Panel of the MOH Drug Formulary. Internationally, she is a member of the ASEAN Working Group on Pharmaceutical Development and WHO panel member for the development of the WHO Guideline on Pharmaceutical Pricing Policies. Dr Salmah Bahri is also an active researcher in MOH. Among her important national research projects are the Drug Utilization in the Treatment of Diabetes Mellitus in the Ministry of Health Facilities and National Survey on the Use of Medicines by Malaysian Consumers (2007) and (2012). She has also published some international peer reviewed articles, mostly in collaboration with USM, and various proceedings, compendiums, research reports, articles, bulletins and newsletters for the MOH. She has also co-authored a few book chapters and was recently the main author of a book entitled National Medicine Policy- A Malaysian Perspective (2012).

PROFESSOR DR. SAMSINAH HAJI HUSSAIN

Dr. Samsinah Haji Hussain was conferred a degree in Bachelor of Pharmacy (Hons) from Universiti Sains Malaysia (USM) Penang in 1984 and was awarded a PhD degree in 1987 from Leeds University, United Kingdom in the field of neuroendocrinology under the USM fellowship. In 2005 she completed her Graduate Certificate in Pharmacoeconomics specialty training at Monash University, Australia and was promoted to Professor of Pharmacy in 2008. Dr. Samsinah is an appointed member to the National Professor Council under the Pharmacy and Applied Science Cluster (2011 – now), appointed member of the Malaysian Drug Control Authority (DCA) from 2001 until 2013 and also an expert member for the Ministry of Health Malaysia Pharmacoeconomics Technical Working Group. She actively conducts training workshops pertaining to pharmacoeconomics evaluation in healthcare on invitation for the Pharmacy Services Division and Health Technology Assessment Section (MaHTAS) Medical Development Division under the Ministry of Health in Malaysia. She is a member of the Malaysian Pharmaceutical Society, multinational pharmaceutical companies and the Malaysian Pharmaceutical Society and is often invited to be the external examiner and reviewer for universities and international journals. She is also a member of several professional societies and non-government organizations. She is currently the vice-president of the Malaysia Society for Pharmacoeconomics and Outcome Research (MySPOR) and also the Head of the Student Empowerment & Research Unit (SERU) under University of Malaya Student Affairs Division. Dr. Samsinah research interests include economic evaluation and outcome research in the areas of healthcare resource utilization, drug formulary management, paediatric asthma and obstructive sleep apnea syndrome, diabetes and metabolic disorders. In addition her research interests also include initiatives relating to student empowerment and holistic student development.

ASSOCIATE PROFESSOR DR. SHARIFA EZAT WAN PUTEH

Dr. Sharifa Ezat Wan Puteh is a trained Medical Doctor from UKM. She obtained her Masters in Public Health (Hospital and Health Management) and Doctorate in Public Health-Pharmacoeconomics from the United Nations University-International Institute for Global Health (UNU-IIGH). Her main interests are in areas of health inequality and health economics. She is also a coding and case mix consultant (with UNU-IIGH and ITCC UKM) Kuala Lumpur to conduct research & capacity building on Accessibility, Efficiency and Quality of Care in Health System (especially in case mix utilization, drug formulary, payment for services and cost effectiveness of vaccination against cervical cancer. She has presented many papers and posters locally and abroad and is a member on HTA reviews on cost effectiveness, a member of the Health Economics Association Malaysia, the Malaysian Public Health Physicians Association, MySPOR (Malaysian Pharmacoeconomics and Outcome Research Group) and One Health with the Malaysian Public Health Physicians Association, Health Economics Association Malaysia, multinational pharmaceutical companies and the Malaysian Pharmaceutical Society and is often invited to be the external examiner and reviewer for universities and international journals. She is also a member of several professional societies and non-government organizations. She is currently the vice-president of the Malaysia Society for Pharmacoeconomics and Outcome Research (MySPOR) and also the Head of the Student Empowerment & Research Unit (SERU) under University of Malaya Student Affairs Division. Dr. Samsinah research interests include economic evaluation and outcome research in the areas of healthcare resource utilization, drug formulary management, paediatric asthma and obstructive sleep apnea syndrome, diabetes and metabolic disorders. In addition her research interests also include initiatives relating to student empowerment and holistic student development.
PROFESSOR SHU CHUEN LI

Professor Shu Chuen Li is Chair Professor and Head, Discipline of Pharmacy & Experimental Pharmacology, School of Biomedical Sciences, University of Newcastle. Prior to this, Professor Li has worked as an academic at the National University of Singapore (NUS) and as Acting Director & Deputy Director, Pharmaceutical Evaluation Section (PES) of Pharmaceutical Benefits Branch, Australian Commonwealth Department of Health & Ageing. During his period in Singapore, Professor Li also served as the Visiting Specialist /Consultant to the Health Sciences Authority (HSA), and has been instrumental in developing the Pharmacoconomics and Drug Utilization Unit at the Centre for Drug Administration. In his capacity as Acting Director & Deputy Director of PES in Australia, Professor Li was among the few pioneers that put the principles of pharmacoeconomic evaluation into practice for regulatory affairs, and has been involved in implementing the 1st version of the Australian Pharmacoconomics Guidelines and developing the 2nd version of the same Guidelines. Professor Li was a Director of ISPOR from 2006 -2008, and a founding member of the ISPOR Asia Consortium. Additionally, Professor Li have held many other consultative positions in Australia and in various Asian countries both for the pharmaceutical industry as well as for governments. Besides his expertise in health technology assessment and pharmaceutical policy, Professor Li is a very active researcher in health service research and pharmacoepidemiology. He has published more than 350 scientific manuscripts and conference abstracts and has been invited to present in numerous international conferences.

DR. SORAYA AZMI

Having trained as a physician at the University of Adelaide, Australia, and obtained a Masters in Public Health at Harvard, Soraya is founder and Managing Director of Azmi Burhani Consulting, a health research services company, and Versas Research, a clinical research organization. Her career in clinical research has spanned more than a decade. She began her career in the Malaysian Ministry of Health, Malaysia, first as a physician then a researcher. Health economics and outcomes research is one of her main areas of interest. After earning her Masters degree, she worked in the United States for the United Nations Population Fund and Pfizer Pharmaceuticals (New York headquarters) as well as the consulting arm of NDChalth in Arizona (now part of Wolters Kluwer). Soraya is a current committee member of the Malaysian National Committee for Clinical Research (NCCR) chaired by the Director-General of Health, committee member for the Malaysian Society of Pharmacoconomics and Outcomes Research (MySPOR) and is the organizing committee chair for the 2014 Pharmacoconomics and Outcomes Research Conference organized by MySPOR. Soraya also serves on the management board of Asia CRO Alliance, a network of clinical trial partners across Asia.

PROFESSOR DATO’ DR SYED MOHAMED ALJUNID

Dr Syed Aljunid is a Professor of Health Economics and Interim Director of United Nations University- International Institute for Global Health. Prior to this he served as a Senior Consultant in Public Health Medicine and Head of Department of Community Health, Faculty of Medicine, National University of Malaysia (UKM). He obtained his MD from Universiti Kebangsaan Malaysia, Master of Science in Public Health from National University of Singapore and PhD in Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine. He is now the head of International Centre for Casemix and Clinical Coding of UKM. He is currently involved in supporting a number of developing countries to develop and implement casemix system under Social Health Insurance programmes. His work on casemix system in UNU-IIGH covers research and capacity building programmes in Malaysia, Indonesia, Philippines, Mongolia, Vietnam, China, Saudi Arabia, United Arab Emirates, Sudan, Nepal, Uruguay, Iran, Chile, Kenya and Ghana. He is the developer of international casemix grouper UNU-CBGs as well as Clinical Cost Modelling Software (CCM Version 2.0). Currently, he serves as the co-chair of Morbidity Technical Advisory Group of ICD-11 Revision of World Health Organisation-Family of International Classification. He is actively involved in teaching public health medicine, health economics and health management courses in MPH, MBA and PhD programmes jointly run by UNU-IIGH and its partner universities in Malaysia, Nepal, Yemen, United Arab Emirates and Sudan. He served as consultant and adviser to a number of international agencies including International Atomic Energy Agency, World Health Organisations, GTZ, AUSAIM, UN-AIDS, UNDP, UNICEF, GAVI, Asian Development Bank and the World Bank in various international projects. He is the Past-President of the Public Health Medicine Specialists’ Association of Malaysia and Founding President of Malaysian Health Economics Association (MY-HEA) and Malaysian Society of Pharmacoconomics and Outcome Research (MY- ISPOR).

YEW WEI TARNG

Presently the Managing Director of Eisai (Malaysia) Sdn. Bhd, Yew Wei Tarng is also the President of the Pharmaceutical Association of Malaysia (PhAMA). Mr Yew began his journey within PhAMA as the Chairman of the Human Resource Committee from 2006 - 2008. He then went on to become the Chairman of Regulatory Affairs Committee with the association and continues to hold this position to date. In 2006, Mr Yew became Vice President of PhAMA, a position he has held until he became the President of the association in September 2012. Besides PhAMA, Mr Yew has also been active in other associations such as the ASEAN Pharmaceutical Research Industry Association (APRIA), where he was chairman of the association for a year. APRIA is a regional association representing the research-based pharmaceutical companies in ASEAN, committed to ensuring optimal regulatory environment for the continued development of the pharmaceutical industry to further improve the health and well-being of ASEAN patients. Mr Yew holds a Bachelor of Pharmacy with a minor in Management from Universiti Sains Malaysia followed by a traineeship at the National Pharmaceutical Control Bureau and the Kuala Lumpur Hospital. He then went on to participate in the Global Program for Manager Development at Duke University in North Carolina and he studied as well at the Kellogg School of Management in Chicago.
Dr. Zafar Ahmed is a Senior Lecturer at the International Center for Casemix and Clinical Coding Faculty of Medicine Kebangsan Malaysia. He is a Consultant Health Economist and Casemix Consultant. He was involved as a Consultant in the development and implementation of Casemix System in Mongolia, Indonesia, Philippines, Uruguay and Vietnam. His consultancy in those countries involved the development of Benefit Package for the reimbursement on Case base Tariffs developed on DRG system. He is also one of the Consultants who developed first Case-Mix Online project for Casemix training online. Among his involvement in Casemix project are ongoing Casemix implementation in Vietnam, the recently concluded implementation of Casemix in all kemkes (Ministry of Health Indonesia) hospitals in Indonesia, 26 hospitals in Uruguay, development of national tariff in the context of Casemix for the social health insurance in the Philippines, and Casemix system implementation in Uruguay, Mongolia and Vietnam. Dr. Zafar Ahmed is actively involved in graduate level teaching both at UKM (Universiti Kebangsaan Malaysia), and UTM (Universiti Teknologi Malaysia). His research interest includes Disease burden and economic burden of disease, economic evaluation of health interventions, and disease and economic modeling. Apart from his consultancy work with UNU-IIGH, he is a Clinical Coordinator/Consultant of Casemix Unit in Hospital University Kebangsaan Malaysia. This is the Department in the university which pioneered the development of DRG base solution for hospital in UKM. Furthermore, he is a consultant for COHORT Malaysia, first ever COHORT in Malaysia and part of Asian COHORT Consortium. Malaysian COHORT is to study 100,000 sample in Malaysia for studying the chronic disease in Malaysia. Beside this he has extensive experience in evaluating the Hospital Information System (HIS) in Malaysian hospitals. He has special interest in developing the Decision Support Systems (DSS) in the clinical environment, especially in the pharmacy environment, for that he has worked with various hospitals, both in public and private sector, to develop Drug decision support system using existing drug knowledge bases. Majority of his publications and research papers are Economic Evaluation in healthcare, Casemix implementation and Health Care System.