Highlights from 113th Abbott Nutrition Research Conference

- Health economic studies are used to improve health through rational decision making, advised **Dr John Nyman (USA)** (p. 3).
- Patient registries are a way to collect, analyze, and communicate clinical, economic, and humanistic aspects of a health problem or its treatment," noted **Mr Jeff Trotter (USA)**. By their nature, patient registries reflect the 'messiness' of real-world settings (p. 4).
- "Patient-reported outcomes (PRO) reflect what is important to the patient, said **Dr Louis Matza (USA)** (p. 5).
- **Dr Tomas Philipson (USA**) advised, "Randomized controlled trials are useful for showing clinical efficacy, but they cannot show a therapy's effects under real-world conditions. Understanding real-world effects requires real-world data" (p. 6).
- **Prof Mohandas Mallath (India)**. Although the incidence of cancer is lower in the Indian population than in North American and in other Asian populations, the impact is huge because of sheer numbers. Cancer in India has reached one million incident cases per year (p. 8).
- **Dr Marianna Sioson (Philippines)**, a physician nutrition specialist from Manila, discussed how some private and government healthcare systems in the Philippines have made great strides in addressing hospital malnutrition (p. 9).

113th Abbott Nutrition Research Conference

Nutrition Health Economics and Outcomes Research

Dr Robert Miller (USA), Abbott Nutrition Divisional Vice President R&D and Scientific Affairs, welcomed 16 acclaimed speakers and more than 40 national and global participants to the 113th Abbott Nutrition Research Conference on Nutrition Health Economics and Outcomes Research (HEOR). Organized by the Abbott Nutrition Health Institute (ANHI), the meeting took place July 30 and 31, 2012, in Singapore.

Meeting of many minds

Abbott's Nutrition HEOR conference gathered experts from a wide range of fields—health economics, epidemiology, public health, clinical medicine, and nutritional science—to discuss a common theme, the costs of malnutrition in hospital care today. With a robust agenda and a variety of viewpoints, the conference offered a broad perspective on how nutritional status can influence patient outcomes and costs of care in hospitals around the world.

Dr Miller opened, "HEOR studies have the potential to provide 'simple' answers to complex healthcare issues. As scientists and economists together, we are looking for ways to improve health outcomes yet cut costs for society. HEOR studies help us find evidence of value." Dr Miller emphasized, "At Abbott, we recognize our responsibility to help healthcare stakeholders improve the health of infants, children, and adults worldwide."

113th Abbott Nutrition Research Conference Faculty

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Overview of the conference program

Healthcare systems around the world today are increasingly challenged to provide effective care, yet they are expected to control the cost of delivering such care. Reducing the incidence and severity of disease-related malnutrition is an important way to decrease the disease burden imposed on patients and their families and to decrease their use of healthcare resources. Over the course of 1.5 days, the Nutrition HEOR conference addressed 4 key questions:

1. What is the global prevalence of disease-related malnutrition, and what are its effects?
2. What is HEOR, and how can it demonstrate the value of nutrition in healthcare?
3. What is the evidence that nutritional interventions are cost-effective?
4. What is the present state of nutritional care in Asian hospitals?

Setting the stage on global malnutrition

The dual burden of disease

Prof Chia Kee Seng (Singapore), Dean of Saw Swee Hock School of Public Health at the National University of Singapore, opened the conference by pointing out the dual burden of disease today.[1] High-income countries are experiencing growing numbers of people with chronic, non-communicable diseases such as diabetes, heart disease, and cerebrovascular disease, yet they are challenged by epidemics of emerging and re-emerging infections. At the same time, low- and middle-income countries continue to battle high rates of infectious disease, but they must also cope with epidemics of non-communicable diseases. Specifically, data from 2008 show that heart disease, stroke, and cerebrovascular disease are the top causes of death in high-income countries and account for 24% of deaths, while lower respiratory tract infections still cause nearly 4% of deaths.[1] On the other hand, lower respiratory tract infections, diarrheal disease, and HIV/AIDS cause 27% of deaths in lower-income countries, but heart disease and stroke now cause more than 10%.[1]

In today's milieu of cost-containment, Prof Chia asked, "How will we balance care for communicable and non-communicable diseases?" He advised making evidence-based decisions using "real-world" data from HEOR studies.

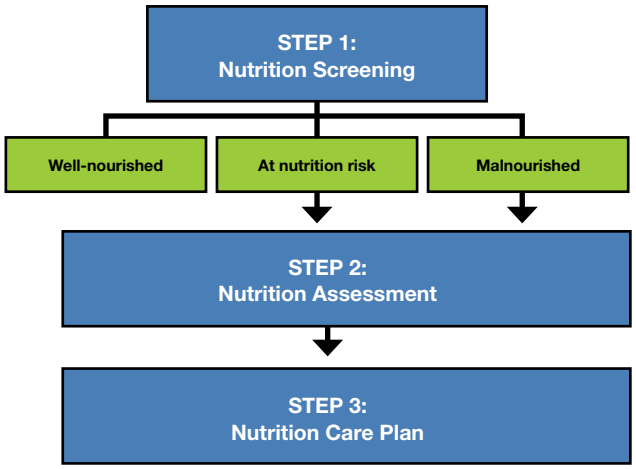

Figure 1. The Nutrition Care Pathway

Disease-related malnutrition: a global crisis

Health researchers today are taking a fresh look at malnutrition as a hidden cause of poor patient outcomes and climbing costs of care. **Dr Refaat Hegazi (USA),** Abbott Nutrition Medical Director, set the stage by discussing disease-related malnutrition.

Dr Refaat Hegazi, Speaker

Disease-related malnutrition is both common and costly everywhere in the world. Malnutrition (as under-nutrition) ranges from 20% to 50% of patients in hospitals,[2] and is similarly frequent in long-term care residences. In healthcare settings, malnutrition is under-recognized[3] and under-treated.[4] In hospitalized patients, the consequences of malnutrition are serious and costly—high risks for post-operative complications, pressure ulcers, and mortality, along with longer lengths of hospital stays, and higher costs of care.[5-8] The cost

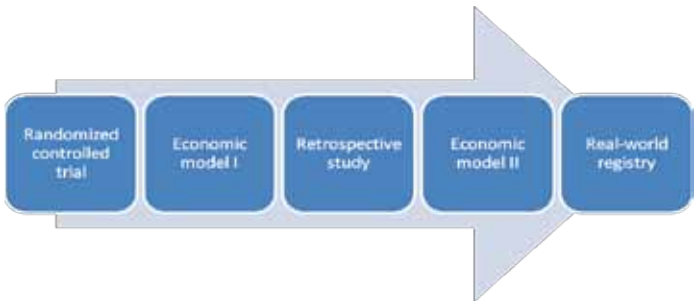

Figure 2. The evolution of evidence for healthcare interventions.

of a hospitalization episode for a person who is under-nourished may be as much as 2- to 3-fold higher than the cost for a well-nourished person.[9,10] At the same time, globally widespread obesity leads to high risk of prediabetes, metabolic syndrome, and diabetes, conditions that are also associated with an excessive toll on personal health and a high burden of costs to healthcare.[11]

Despite the high prevalence of disease-related malnutrition worldwide, many hospitals have not yet made routine practice of nutrition screening, nutrition assessment, and intervention. Dr Hegazi advised, "The nutrition care pathway[12] is a logical, stepwise approach to address the problem of malnutrition," as illustrated in **Figure 1.**

For treatment, food enrichment can be used for some patients, while others may need oral nutritional supplements to help meet energy and critical nutrient needs. For patients who cannot meet needs with standard food and supplements, tube-fed enteral nutrition started early can help overcome or prevent nutritional deficiencies and if not accessible or inadequate, parenteral nutrition could be started. Disease-specific oral or enteral nutrition formulas are now available for patients with special needs,[13] such as those recovering from surgery, or those with acute respiratory distress syndrome, kidney disease, diabetes, or experiencing serious loss of muscle.

Clinical researchers and health economists

Dr. Jamie Partridge (USA) HEOR Director, Abbott Nutrition, noted the complementary roles of clinical researchers and health economists in gathering a full spectrum of evidence on the benefits and costs of hospital nutrition intervention **(Figure 2)**.

Clinical researchers conduct prospective, randomized, controlled trials to determine whether a given intervention can improve health outcomes. Economists use models to estimate whether the intervention is practical beyond the trial setting. Retrospective studies can help build a picture of health and cost consequences of nutritional interventions by using "natural" experiments, eg, comparison of outcomes before and after an intervention. Additionally, retrospective data can be used to generate hypotheses for clinical studies. Finally, health outcomes researchers can use large-scale patient registries to determine how well interventions actually work in the real world, and at what expense or savings to the healthcare system.

What is HEOR?

Economic evaluations and models: the basics

Health economic studies are used to improve health through rational decision making. Health economists focus on financial information such as costs, charges, and expenditures. As a starting point for the discussion of healthcare finances, **Dr John A Nyman (USA)** reviewed 2 key metrics commonly used in economic evaluations—incremental cost-effective ratios (ICERs) and quality-adjusted life years (QALYs).

The ICER compares measures of costs for 2 different treatments (C_1, C_2) relative to measures of effectiveness of the same 2 treatments (E_1, E_2), as $(C_2\text{-}C_1)/(E_2\text{-}E_1)$. The ICER is interpreted as the price of an additional unit of effectiveness obtained by using treatment 2 instead of treatment 1. When the denominator of the ICER uses a specific health-related measure to measure the gain in effectiveness, eg, a reduction in cholesterol level or diastolic blood pressure, the economic evaluation is called a **cost-effective analysis**. To a consumer, the cost-effective analysis answers, "How much does it cost to achieve a gain in a certain health measure by using intervention 2 instead of intervention 1?"

A simple **cost analysis** ($\Delta C = C_2\text{-}C_1$) is used to assess the incremental cost of a treatment in cases where the benefit is captured by the cost savings derived from that treatment. Three types of cost analyses used in practice today are (1) budget impact, (2) return on investment, and (3) cost of illness. For example, a recent budget impact analysis estimated the total cost saving to the Dutch healthcare system if older people in the community were given nutritional supplements for disease-related malnutrition; overall costs of care were reduced by nearly 20%.[14]

Economic evaluations			
Cost analysis C_2-C_1 = ΔC	Cost-effective analysis $(C_2-C_1)/(E_2-E_1)$ = ΔC/ΔE	Cost-benefit analysis $(B_2-B_1)/(C_2-C_1)$	Cost-utility analysis $(C_2-C_1)/(QALYs_2-QALYs_1)$ = ΔC/ΔQALYs

For a **cost-benefit analysis**, both cost and effectiveness are measured in units of financial currency, where a benefit-cost ratio or $(B_2-B_1)/(C_2-C_1)$ could be employed. However, since health effects cannot be sold, their value is difficult to ascertain; alternative approaches have been sought. Accordingly, many studies now capture effectiveness with quality-adjusted life years. QALYs account for both quality and quantity of life lived, and thus combine morbidity and mortality in a single measure.

When QALYs are used as a measure of effectiveness, the economic analysis is called a **cost-utility analysis:** $(C_2-C_1)/(QALYs_2-QALYs_1)$ = ΔC/ΔQALYs. For example, a recent study from Germany showed improved quality of life from 3-month use of oral nutritional supplements in patients with disease-related malnutrition.[15]

According to Dr Nyman, "[In the US], some people feel that basing healthcare interventions on cost-effectiveness or cost-utility is a form of healthcare rationing." As a result, economic evaluations have not officially been used to determine US coverage. By contrast, the National Institute for Clinical Excellence (NICE) in the UK requires that a cost-utility analysis be conducted for any new technology to be covered under the National Health Service.

Dr John Nyman, Speaker

Patient registries and nutrition

"Patient registries are a way to collect, analyze, and communicate clinical, economic, and humanistic aspects of a health problem or its treatment," began **Mr Jeff Trotter (USA)**. Patient registries are:

- Data collection systems for observational findings
- Non-randomized studies
- Not hypothesis-testing but not purely exploratory
- Usually large, multicenter, long-term projects
- Almost always about clinical practitioners and everyday practices

By their nature, patient registries reflect the "messiness" of real-world settings. For example, registry data on nutritional interventions could demonstrate how a product or procedure works in the context of real-life caregivers, in various hospital settings, and in mixed patient populations. Registry data can extend and confirm results from randomized, controlled trials by showing safety and effectiveness in a broader patient population, and can also determine the expense or savings to the healthcare system.

The conditions under which products are examined for regulatory approval are generally not the conditions under which the products are actually used. Mr Trotter noted, "A patient registry is as different from a randomized and controlled trial as Chicago's rush-hour traffic is from a race car test-drive."

Who needs real-world data and why? Health authorities, regulatory authorities, pricing commissions, payers, physicians, hospitals, policy makers, and patients all need real-life data because real-life decisions about healthcare are complicated. In today's healthcare climate, there is increasing pressure to provide quality care at lower cost. Yet proven clinical efficacy and cost of a product do not tell the full story of its actual effectiveness and economic impact. The price of one unit of nutritional product in a hospital setting is only the tip of the iceberg.

"A patient registry is as different from a randomized and controlled trial as Chicago's rush-hour traffic is from a race car test-drive."
- Jeffrey Trotter, USA

A health product's price is just the tip of the iceberg.

To fully understand cost-effectiveness, we also need to know about the overall cost of a patient's hospital care, the length of hospital stay, the likelihood of readmission, the staff time involved in care, and a patient's quality of life with or without the nutritional intervention. Data from a patient registry can help tell the whole story.

Jeff Trotter, Speaker

Patient-reported outcomes

Patient-reported outcomes (PRO) reflect what is important to the patient.[16] **Dr Louis Matza (USA)** noted that clinicians have long measured healthcare in terms of morbidity and mortality, while patients care about issues such as symptom bother, pain and fatigue, ability to keep up with daily activities, and the convenience of treatment options. What kind of information can be measured by a patient-reported outcome? Dr Matza summarized:

- Frequency, severity, and bother of symptoms
- Physical function, as needed for activities of daily living and for work productivity
- Psychological well-being (absence of depression and anxiety)
- Health-related quality of life in physical, psychological, and social domains
- Satisfaction with and convenience of treatment

In his presentation, Dr Matza highlighted an example of a patient-reported measure—the Nutrition Screening Initiative (NSI) for nutritional status. The NSI is a 10-item PRO questionnaire used to identify older people in need of nutritional interventions.[17]

What is the HEOR evidence that nutritional interventions are cost-effective?

An economic model: cost-benefit analysis of gastric banding for weight loss

As an example of a health economic model, **Dr Eric Finkelstein (Singapore/USA)** presented results from his recently published cost-effectiveness study on laparoscopic adjustable gastric banding (LAGB) for treatment of obesity.[18] For analysis, he used medical-claims data to estimate the costs and potential cost savings resulting from LAGB. In order to identify a comparator group, he used a method known as propensity score matching. Each obese LAGB patient was paired with a patient in the database of similar demographic and other characteristics who did not undergo the procedure, thus creating interventional and control groups. The cost of the banding procedure was about $20,000. Dr Finkelstein asked the question, "Is this $20,000 justified by cost-benefit analysis?" To answer the question, he considered direct costs of medical care and indirect costs attributed to absence from work (absenteeism) and days present but working ineffectively (presenteeism).

Results showed that the time to break even for cost benefit in LAGB group versus the untreated obese group was 16 quarters (4 years) when using only direct medical costs, but 14 quarters (3.5 years) when direct + indirect costs were considered. When costs were determined for a subsample of obese people with diabetes, the break-even time was only 9 quarters (2.25 years), regardless of whether direct only or direct + indirect costs were used. Overall, Dr Finkelstein and colleagues determined a 5-year savings from LAGB of $11,070 for the full sample and $29,780 for the diabetes subsample. This analysis can be used to help guide policy and decision-making for reimbursement of LAGB costs.

Impact of oral nutritional supplementation on hospital outcomes

As yet another example of an economic model used for analysis of nutritional interventions, **Dr Tomas Philipson (USA)** discussed how he and his colleagues designed a study using 11 years of data from the Premier Perspectives® Database (2000-2010). This database included tens of millions of adult inpatient stays with hundreds of thousands of episodes of oral nutritional supplement use. Dr Philipson's study team sought to evaluate the effect of in-hospital use of oral nutritional supplements (ONS) on specific outcomes—length of stay, episode costs, and probability of 30-day readmission.

"Understanding real-world effects requires real-world data."
- Dr Tomas Philipson (USA)

Because ONS users were older and sicker than non-ONS users, the researchers created a "matched sample" of ONS users and non-users to diminish the potential for confounding. With such pairing (also called propensity score matching), they were able to compare each patient who took ONS with a similar patient who did not take ONS.

Instrumental variable analysis was further used to address potential bias due to nonrandomized treatment selection, which could not be addressed with propensity matching alone. Use of a prospective patient registry would not have eliminated the potential for bias because selection into treatment would still be nonrandom in this design. Results of the full study by Philipson et al are in press in *The American Journal of Managed Care*. The hypothesis is that ONS use demonstrates:

- Shorter length of hospital stay
- Decreased cost of the hospitalization episode
- Reduced likelihood of 30-day hospital readmission

Dr Philipson summarized, "Randomized controlled trials are useful for showing clinical efficacy, but they cannot show a therapy's effects under real-world conditions. Understanding real-world effects requires real-world data."

Nutritional care in Asia's hospital systems

In Asia's emerging markets, what does a snapshot of hospital nutritional care in hospitals look like now? It's complicated; no single snapshot tells the whole story. The governments, people, and states of healthcare are very different in China and India. The Philippines represents yet another situation, as do Singapore, Taiwan, and other countries.

Nutrition professionals conduct research studies to take a closer look at what works and why. According to public health expert **Dr Rob van Dam (Singapore)**, clinical researchers use randomized, controlled trials with well-defined study populations and tightly-controlled conditions to test the *efficacy* of a nutritional product or procedure. On the other hand, health economists design nutrition HEOR studies to test *effectiveness* of a product or procedure under real-life conditions. *Efficacy* is a measure of medical benefit, while *effectiveness* is a measure of medical benefit along with other factors such as patient compliance, quality of life, and cost of care.

- **Clinical researchers use randomized, controlled trials with well-defined study populations and tightly-controlled conditions to test the efficacy of a product or procedure.**
- **Health economists use HEOR studies to test effectiveness of a product or procedure under real-life conditions.**

Dr van Dam noted that diabetes is a condition with a huge health impact in Asia—more than half of all people with diabetes today are living in Asian countries. Randomized trials have shown that lifestyle interventions (diet and physical activity) can substantially reduce the incidence of type 2 diabetes in high-risk groups, including Asians.[19] Emerging evidence shows that lifestyle interventions are indeed feasible and effective in real-life settings.[20,21]

HEOR studies in Asia will help construct a full picture of nutritional care, but each country is expected to yield a very different profile. The following section offers insights, as provided by speakers from China, India, and the Philippines.

Tackling nutrition-related chronic diseases in China

With growing financial resources and power, China is working actively to reform its healthcare system. Two priority reforms are to improve access to healthcare and to provide essential public health services. These and other reforms are important to tackling nutrition-related diseases in China.

Prof Wenhua Zhao (China) of the Chinese Center for Disease Control explained how the government sought to meet these priorities. The first step was to put together a primary care system that would bring family medicine to the community. These community clinics offer programs to help prevent and treat nutrition-related chronic diseases—hypertension, diabetes, and coronary heart disease. As patients visit clinics regularly, the government can become increasingly involved in offering education about nutrition and other lifestyle changes for disease prevention, reinforcing messages about healthy living, providing nutritional advice, and filling prescriptions when treatment is needed.

On increasing access to nutritional advice and treatment, Prof Zhao noted, "Nutrition is not just for rich people; it is for all people."

Nutritional care in Chinese hospitals

Prof Chen Wei (China) reported on nutritional care in Beijing hospitals. In a recent study, almost all patients were screened for nutritional status within 24 to 48 hours of admission to the hospital.[22] About one-third of those screened were found to be at nutritional risk, while about 10% were malnourished.[22] Disease-related malnutrition is common worldwide, so such prevalence numbers are quite similar to those reported elsewhere.

In China, however, only about one-quarter of the patients at nutritional risk received nutritional support while in the hospital. Of those patients who did, Prof Chen reported, "The ratio of enteral nutrition (EN) to parenteral nutrition (PN) as 1 to 6." This number differs markedly from the preferred, evidence-based use of enteral nutrition in other countries (EN:PN ratio,~9:1).

Prof Chen also summarized, "In China, the individual physician usually treats nutritional problems, based on his or her own clinical experience. Nutrition Support Teams are not used, and there is only one dietitian for every 200,000 patients."

Prof Chen recommended physician training as a way to increase awareness of nutrition in hospital care. He also advised greater use of hospital dietitians. Prof Chen further recognized a need to conduct research studies in Chinese hospitals in order to test both the efficacy and effectiveness of nutritional strategies.

HEOR studies and registries in China

Mr Graeme Jacombs (Singapore), Kantar Health, described China as a country in economic transition, where people face 2 fundamental healthcare barriers—limited market accessibility and limited affordability. Based on a study by Kantar Health China, one third of urban and half of rural households said it is very difficult to get essential healthcare because they cannot afford it. At least 45% of healthcare expenses come from patients' own pockets. While government and insurance reforms are underway to make care more accessible and affordable, self-paying patients remain key stakeholders when it comes to making decisions about healthcare.

China is a country in economic transition, where people face 2 fundamental healthcare barriers—limited accessibility and limited affordability.

Kantar Health has conducted extensive National Health and Wellness studies, which include self-reported attitudes of people in urban China (n=20,000), in the United States (n=75,000), and in the European Union (n=55,000).[23] Based on survey results from China in 2009 and the US and EU in 2010, Mr Jacombs provided the following insights regarding unique characteristics of the Chinese population:

- Chinese patients perceive their overall health to be worse than patients in other regions (on a scale of 1=poor to 5=excellent)
  China ~2.9, EU ~3.2, US ~3.4
- Chinese patients want regular physician contact, similar to patients in the US (on a scale of 1= strongly disagree to 5=strongly agree)
  China ~3.3, US ~3.4, EU ~2.8

- Chinese patients have a greater willingness to consult a doctor than patients elsewhere (on a scale of 1= strongly disagree to 5=strongly agree)
  China ~3.6, EU ~3.1, US ~2.9
- Yet Chinese patients do not perceive their doctors as attentive to their needs compared to others (on a scale of 1= strongly disagree to 5=strongly agree)
  China ~2.9, EU ~3.5, US ~3.7
  In fact, a Chinese patient waits 0.5 hours for registration and 1.5 hours to see a nurse, then spends just 6 minutes with a doctor for diagnosis and treatment.

China, like other governments, is looking to reduce costs of medical care. It is thus reasonable to expect that increasingly more real-world HEOR evidence will be used to make payer decisions, eg, price approval, reimbursement, and regional formulary decisions. Such studies are not without challenges in China. Many hospitals do not yet have electronic patient records, even though reforms are planned. Further, some outpatients take their records with them, and hospitals or clinics do not have duplicates.

Economics of cancer-related malnutrition in India

The burden of cancer in India is rising dramatically, especially in terms of disabilities and deaths,[24] reported **Prof Mohandas Mallath (India).** Although the incidence of cancer is lower in the Indian population than in North American and in other Asian populations, the impact is huge because of sheer numbers. Cancer in India has reached one million incident cases per year, and nearly two-thirds of these people die within the year (GLOBOSCAN 2008, as presented by M Mallath). Risk of death is increased among cancer patients with low body weights, especially those who are actively losing weight. Prof Mallath reported that more than 60% of cancer patients studied at Tata Memorial Centre in Mumbai experience weight loss, as is the case elsewhere in the world.[25]

Because of the high likelihood of malnutrition in cancer, Prof Mallath recommends nutrition assessment of all cancer patients using the Subjective Global Assessment (SGA) tool.[26] At Tata Memorial Hospital (TMH), poor nutritional status (SGA rating C) was associated with higher morbidity, longer lengths of stay in hospital and ICU, more days on antibiotics, and lower tolerance of chemo- and radiotherapy. The vast majority of TMH cancer patients in need of nutritional support receive oral feeding (75%) or enteral tube feeding (23.5%), as compared to parenteral feeding (1.5%). When nutrition support therapy is used, the EN:PN ratio is 15:1.

The incidence of cancer is lower in the Indian population than in North American and in other Asian populations, but the impact is huge because of sheer numbers. Cancer in India has reached one million incident cases per year.

For future studies on cancer nutrition in India, Prof Mohandas Mallath posed 2 questions:

- Does use of oral nutritional supplements reduce adverse outcomes?
- Can such supplemental nutrition reduce patients' out-of-pocket expenses by lowering other costs of care?

New diabetes interventions on India's healthcare agenda

More than 60 million people in India now have diabetes, and this number is expected to grow to 100 million by the year 2030,[11] opened **Prof Ambady Ramachandran (India)**.

One of the great concerns about diabetes in India is the high out-of-pocket costs to the patient. The burden is particularly difficult for individuals in lower socioeconomic classes, where costs represent a high percentage of total income—24.5% in the low class and 15.4% in the middle class, compared to 3.5% in the high class.[27]

Prof Mohandas Mallath, Speaker

Prof A. Ramachandran, Speaker

Indians have a genetic predisposition for diabetes and have lower thresholds for environmental risk factors.[28] As a result, Indians develop diabetes at a younger age and at a lower body mass index and waist circumference compared to Westerners. Physical inactivity and more fatty foods in the Indian diet have resulted in increasingly high rates of overweight and obesity, even among children.

Prof Ramachandran discussed new efforts in India to prevent or delay diabetes onset among people with the pre-diabetes condition of impaired glucose tolerance. If successful, such strategies are expected to have both health and cost benefits. In a large Indian clinical study, Ramachandran and colleagues showed that lifestyle interventions (diet/physical activity) or treatment with the drug metformin could each significantly reduce risk of diabetes by as much as 30%.[29] In another study, twice-weekly, text-message reminders about diabetes management were an effective way to increase patient compliance, which in turn improved outcomes (blood lipid and hemoglobin A1c measures).[30]

Chronic kidney disease and nutrition in India

Chronic kidney disease (CKD), predominantly due to diabetes and hypertension in India, is increasingly identified as screening becomes more widespread. **Prof Georgi Abraham (India)** noted that end-stage renal disease develops in about 250 people per million per year in India.[31] With a population of 1 billion, 250,000 individuals may now be experiencing end-stage renal failure. Yet there are only 1000 kidney specialists to care for them.

Prof Abraham described insights from India's Chronic Kidney Disease registry (n=63,538). Because of financial limitations, Indian renal patients delay consultation with a nephrologist until the damage is quite advanced. About 75% of patients in the registry have advanced CKD, ie, stages IV or V (end-stage). When people with CKD do consult a doctor, more than 70% of treatment costs must be paid out-of-pocket. As a result, Prof Abraham estimated that "over 90% of people with end-stage renal disease die within months of diagnosis because they cannot afford treatment."

Protein-energy wasting plays a major role in the high risk of death in advanced CKD. The link between CKD and malnutrition is evident; body mass index declines with advancing stage of disease, and hemoglobin levels fall. By the time peritoneal dialysis is started, more than 60% of patients are considered malnourished.[32] Prof Abraham presented evidence showing that renal-specific nutritional supplements during dialysis can improve nutritional status (serum albumin level),[33] an affordable strategy that is expected to help contain costs.

Nutritional interventions in hospitals in the Philippines

Dr Marianna Sioson (Philippines), a physician nutrition specialist at The Medical City tertiary care hospital in Manila, discussed how some private and government healthcare systems in the Philippines have made great strides in addressing hospital malnutrition. Much of this change has been driven by the Philippine Society of Parenteral and Enteral Nutrition (PhilSPEN).

When compared to other counties in southeast Asia (Singapore, Vietnam, Malaysia, and Thailand), the Philippines has the lowest per capita government expenditure on healthcare—just $77 USD per year (World Health Organization data). Yet some hospitals in the Philippines have tackled malnutrition in a big way:

- Hospitals increasingly use Nutrition Support Teams (physician, nurse, pharmacist, and dietitian) who develop nutrition care plans for individual patients.
- Nutrition topics are now included in the medical school curriculum.
- Physician training programs, eg, surgical residencies, are newly offering nutritional training and certification.
- Both enteral and parenteral nutrition supplies are now on the Philippine National Drug Formulary.

The Medical City hospital has Joint Commission International Accreditation, which requires nutrition screening for all patients. The Medical City exceeds the basic standard by conducting full nutrition assessments for all patients. In addition, each patient receives a personalized Nutrition Care Plan.

Dr Marianna Sioson, Speaker

Prof A. Ramachandran and Prof Georgi Abraham, (Speakers), **Dr Mujtaba Ali Khan and Dr Rosemary Riley,** (attendees)

A future for HEOR research in Asia

Asia is experiencing dynamic changes; industrialization, urbanization, and aging of the populations are all taking place at the same time. In this climate of change, many stakeholders must make decisions about nutrition and health—patients and their family members, clinicians, ministries of health, governments, and private payers. Since these stakeholders need data to make sound decisions, research studies will play a key role in planning for the future of nutrition care in Asia. To this end, randomized, controlled clinical trials are needed to demonstrate efficacy of treatments, while HEOR real-world observations are required to show effectiveness.

Dr Virna Gamalinda and Dr Jose Dimaano, attendees

Take-home messages from the conference

In 2012, one truth is evident in Asian healthcare and nutrition—there is no single profile across all countries. Hospitals, physicians, and people in urban and rural regions of various Asian countries differ widely in terms of resources, attitudes, and use of nutrition as therapy. Speakers and attendees at the *113th Abbott Nutrition Research Conference on Nutrition Health Economics and Outcomes Research* helped build a list of action items for improving nutritional care:

1. Identify where nutrition has benefits, and present nutrition as a value proposition.
2. Across Asia, determine who are the decision-makers for clinical nutrition, and determine what evidence they need to enhance care.
3. Set research and educational goals that will build the right evidence for the right stakeholders.

Dr Rob van Dam, Speaker

Abbott Nutrition has a long tradition of convening research conferences addressing emerging issues in adult and pediatric nutrition science. The first research conference took place in 1950. Today, we are continuing that tradition with the 113th Abbott Nutrition Research Conference, and we plan to build upon this rich tradition in the years ahead.

Table 1. Presenters at 113th Abbott Nutrition Research Conference: Nutrition Health Economics and Outcomes Research

Chia Kee Seng, MD, (Singapore)	*The dual burden of disease*
Refaat Hegazi, MD, PhD, MPH, (USA)	*Disease-related malnutrition: a global crisis*
Jamie Partridge, PhD, MBA, (USA)	*The emerging field of nutrition health economics and outcomes research*
John A. Nyman, PhD, (USA)	*Economic evaluations in healthcare: Overview, policy, and uses*
Jeff Trotter, MBA, (USA)	*The role of registries in nutrition health economics and outcomes research*
Louis Matza, PhD, (USA)	*Patient-reported outcomes measures (PROs): Overview and relevance to research on nutrition*
Eric Finkelstein, PhD, MHA, (Singapore/USA)	*Two examples of economic analyses of weight loss interventions*
Tomas Philipson, PhD, (USA)	*Creating credible evidence in nutrition HEOR: An illustration through the effects of ONS on hospital outcomes*
Rob M. van Dam, PhD, (Singapore)	*Interventions to change health behaviors and prevention of type 2 diabetes in Asian populations*
Wenhua Zhao, MD, PhD, (China)	*Healthcare policy and burden of diet- and nutrition-related chronic diseases in China*
Chen Wei, MD, RD, (China)	*Nutritional support and disease-related malnutrition in China*
Graeme Jacombs, MS, (Singapore)	*Challenges of health economics and observational research in China*
Mohandas K. Mallath, MD, DNB, (India)	*Healthcare demographics, prevalence, and pharmacoeconomics of hospital malnutrition in oncology setting: Indian perspective*
A. Ramachandran, MD, PhD, DSc, FRCP, (India)	*Diabetes in Indians – Potential solutions: Primary prevention a way forward?*
Georgi Abraham, MD, (India)	*Healthcare demographics, prevalence, and pharmacoeconomics of hospital malnutrition in nephrology setting: Indian perspective*
Marianna Sioson, MD, DPBCN, MSCN, (Philippines)	*Healthcare landscape and benefits of aggressive nutrition intervention in hospital systems in the Philippines*

Dr Tomas Philipson, Speaker

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