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TOWARDS THE PROVISION OF APPROPRIATE MATERNITY SPACES IN HEALTHCARE FACILITIES OF MALAYSIA

- Spatial Studies On The Selected Maternity Units.

Author: **Norwina Mohd Nawawi** (PhD Candidate)

Department of Architecture, Kulliyah of Architecture and Environmental Design, International Islamic University Malaysia, Jalan Gombak, 53100 Kuala Lumpur.

norwina@iiu.edu.my. norwina19@yahoo.com

Abstract:

Public facilities for maternity care is among the earliest facility provided for the Malaysian public by the British. Maternity care includes pre and post-natal care that were provided as part of the primary care towards secondary care and subsequently a follow-up by the primary care caregivers. Traditionally, maternity care was given in the home. However, with Malaysia driving towards achieving a low mortality rate in childbirth, and control environment can only be obtained in special spaces, Maternity and Child Health Clinics, Alternative Birthing Centres and Labour and Delivery Units of hospitals were established. The contention was brought about among healthcare architects and caregivers on what are 'adequate' spaces amidst appropriate and functional spaces. The spatial study is thus aimed to review and analyse what the caregivers meant by 'adequate' spaces in meeting the needs of maternity services against the use of natural instincts or gut feelings.

The methodology used will include observation, physical survey on the selected maternity facilities of the country; questionnaire survey on staffs and patients; as well as studies of the as-built drawings. The finding of this research is to provide the adequate and appropriate maternity care spaces in reciprocal to the level of care, as a guide to future maternity care projects in the country.

Keywords: Appropriate, Functional, Maternity, Spaces,

INTRODUCTION

The planning and design of any public healthcare facilities in Malaysia relies very much on the country's 5-year Malaysian Plan planning scenario. Each 5 years plan, since independence, will identify specific requirements for the country to emphasise nationally towards national goals and focus intimately at local issues at local level.

Gauging on international indicators of the World Health Organisation (WHO), for which Malaysia is a member country, the healthcare services and facilities of Malaysia falls within the thriving economies of a developing country.

Throughout the Malaysia Plans that stretches from 1957 till presently, emphasis to Maternal and Child Health (MCH) and now known as Family Health Development, has been a consistent agenda. Facility development in the healthcare sector had always included the maternal and child health in their new, upgrading or replacement projects. To date, even WHO in their report for 2005(18) had covered extensively the issue of Maternal and Child Health as the basis for better world condition.

The paper begins by proceeding to the methodology of research undertaken for this study; describing the significance the study may contribute to the mass especially designers of healthcare facilities; and providing the limitation of study as ascribed by the period of study against the broad issue of spaces in maternity unit entails.

A brief background on the procurement of the healthcare facility delivery system in the country is explained bring alight the issues of procurement to spaces required. The definition in context, clarifies the area of study before the case studies on selected basis provides the insight on the dilemma designers faced in aspiring to provide the appropriate facility that is flexible and appropriate for all times amidst changing health trend, technology and both users' (care givers and patients) as well designers perceived expectation.

The findings is not intended to be conclusive but suffice to throw some light on the approach towards better provision of spaces of care rather than following blindly the standard brief of requirements without knowledge of its implications. The findings are also intended to provide avenues for future research towards obtaining the appropriate spaces not only for maternity care but other spaces of care as one human creates conducive and effective environment to others. Insyaallah.

METHODOLOGY OF APPROACH

The methodology of approach adopted for the study was through literature review of the maternity care from the World Health Organisation (WHO); Ministry of Health Malaysia (MoH) official publications and unpublished documentations of norms and guidelines; the National Health Services (NHS) of United Kingdom (UK) and

Australian Hospital Planning Units (HPU) on comparative basis as secondary data; followed by qualitative method in collecting primary data i.e. by random survey and visits to selected healthcare facilities for observation and questionnaire; as well as the study of as-built drawings on selected case studies - old, existing and new maternity care facilities of Malaysia (refer Appendix 1).

The analysis were done as follows:

1. on as-built drawings (where available) to the project brief (where available) to the spaces provided in comparison to the standard O&G (1990)(refer Appendix 2) norms as to the level of care;
2. the changes or adaptation made on existing facilities in meeting the new healthcare O & G standards¹ for the assigned level of care;
3. the changes anticipated to the new facilities in meeting the ever dynamic requirements of care in specific level of care;

The findings of the above provide feedback on the provision against demands and perceive requirements of the 'time'². Although there may be many anomalies, the findings should be able to denote some directions towards providing the appropriate maternity spaces at appropriate level of care, at appropriate location and at appropriate time, build within appropriate time frame for appropriate people.

SIGNIFICANCE OF THE CONTRIBUTION

The study is not able to bring to a single conclusion but suffice, for the moment, to provide the necessary requirements for designers and caregivers to ponder in their enthusiasm to complete the facilities according to the stipulated time as required by the project.

The necessary requirements include certain insights and understanding on the following:

- (i) The rigmarole and tedious process in the planning and designing 'appropriate' spaces in a healthcare project;

¹ The copy of new O&G operational policies that replaces the 1996 circulars is still not available at the time of the study as referred by Kuantan Hospital O&G specialist.

² Healthcare projects are well known for its lengthy process from initiation to planning, design and construction. The requirements in the project brief need to project to about 5 –10 years ahead of the schedule construction period to make the facility viable and meet the appropriate requirement on completion. The Brief is indeed an important document and should be well thought of in depth before making it the bible for designers. The Designers or architects should question the brief for its relevance in the process as a check and balance to the needs, prior to commencement of design.

- (ii) The holistic scenario of healthcare for designers and care givers alike to ponder in context before proceeding to planning and designing the specific area;
- (iii) The language one care to speak and able to portray ideas that could engulfed the requirements of the user of the facility – i.e. the patient, the care givers, the support staff, the maintenance and others, in the most effective way;
- (iv) To be aware on the needs to the level of care in any healthcare facility projects and set out to include the flexibility required for any future changes and;
- (v) In using maternity spaces as the case study; how one should address the well women issues as patients at the various level of care

in order that disciplines involved in the creation of the healthcare environment, more so the maternity spaces of any healthcare project in the country, will take the necessary steps to be more coherent, knowledgeable, have compassion and able to provide the appropriate spaces to facilitate the process of care to the patients i.e. the mothers as the mother of the nation.

SCOPE OF STUDY AND ITS LIMITATION

Under the Federal Constitution of Malaysia, the Federal Government is responsible for medical and health matters of the country's population and thus the study's emphasis on public healthcare with least reference to private healthcare set up. Another reason for the choice made towards public healthcare facilities in comparison to the private sector facilities was the inaccessible data. The current private healthcare facilities are business focus rather than service-orientated as thus render the study futile in its mission and vision although they do contribute significantly to the nation's health statistics for a limited and well-to-do-patient population.

On Malaysian public healthcare, family healthcare development covers a series and levels of care in itself. These include the likes of The Maternal and Child Health Clinics (MCH), the Rural Health Clinic (*Klinik Desa*), the Health Clinic (*Klinik Kesihatan*) now called Community Clinic of primary care clinics; the Birthing Centres and Alternative Birthing Centres (ABC) in the rural area; the Low Risk Units of hospitals; the maternity units and labour delivery unit of hospitals. The study, within it limited time frame, is not able to cover all the levels but suffice to describe what each level of care may entails in terms of its expected services and hence the spaces that

accompany them. Details, however, were limited to Labour Delivery Unit (LDU) of each selected hospital in its provision of spaces and functions.

Due to the limitation of time, the study are not able to address the need of 'space' as a 3 D-dimensional element in healthcare, where 'home' is the best place to be when 'birthing' where other requirements addressing the five senses of touch, feel, taste, visual, auditory needs that include thermal comfort, culture and family comes into being. The study was not able to address the conditions of home as the origin of maternity care nor the needs of traditional birth attendant (TBA) that complement the care. The study merely touches the standard requirement as envisage by the clinical needs as address in the O&G (1990) paper with some comfort and innovation each and individual hospital /healthcare facility try to address the national interest with each new policy brings in their existing and new facility.

BACKGROUND

The well being of any country rested on many factors among which are its health indicators, literacy level, the Gross Domestic Product (GDP) and the Gross National Product (GNP). Malaysia had seen the progressive trend of both the health indicators growth rate 2.2% (2001), maternity mortality rates from 3.2 in 1957 to 0.2 in 1996, the literacy level from 58% in 1970 to 93.5% in 2000, as well as the fluctuated GDP per capita that stand at 9,030 at 2001 after the economic down turn in 1998. The well being of the country rests upon its citizen, the people. As the human resource, that make or break the country, the people, whom are made up of individuals, formed a family unit, the community and the nation. The wife, mother or bearer of the child remains the focus for the well being of the new generation.

As reported in the WHO World Report 2005 on the state of maternal and child health Malaysia: 'Malaysia also has a long-standing tradition of professional midwifery – since 1923. Maternal mortality was reduced from more than 500 per 100 000 births in the early 1950s to around 250 in 1960. The country then gradually improved survival of mothers and newborns further by introducing a maternal and child health programme. A district health care system was introduced and midwifery care was stepped up through a network of "low-risk delivery centres", backed up by high-quality referral care, all with close and intensive quality assurance and on the initiative of the public sector authorities. This brought maternal mortality to below 100 per 100 000 by around 1975, and then to below 50 per 100 000 by the 1980s'.

Despite the favourable WHO report (2005) above, among the 10 causes of hospitalisation in Malaysia is still normal delivery with 17.70% and Complication of Pregnancy with 11.49% of the total discharges in 2002(11). Although emphasis were made to educate the population to utilise the decentralised community birthing facilities (ABC) even to the rural areas, due to several reasons including fear of complication, mothers in most states prefer to attend hospital delivery.

Thence the study on maternal health care with emphasis on maternity healthcare public facilities and spaces within the Labour Delivery Unit (LDU) of hospitals as case studies.

HISTORICAL SOJOURN VIS-À-VIS MATERNITY CARE

The provision of public healthcare facilities in Malaysia has been inherited from the colonial British. With exception of the estate hospitals provided by agricultural companies for the plantation workers and some private hospitals grown from the missionary and ethnic endeavour, the British East India Company had established its temporary hospital at the E & Hotel site, in Penang Island in the year 1812(6). The first Pauper hospital was constructed in 1854 by a Bengal-Chinese, Ah Poo, at the junction of Hospital and Residency Road. When the East India Company was dissolved in 1858, the control of the medical services was passed to the Colonial Office. The first general hospital built in Penang was constructed by the Public Works Department (the present JKR) that was established in 1867(6).

The management of public healthcare delivery had changed hands between state and the federal government with each Constitutional change. In 1948, the healthcare delivery was decentralised as a state matter as stated in the Federation of Malay Agreement. The state of healthcare and healthcare facilities then were largely based on the availability of financial and other resources of each state. The situation was changed on independence in 1957 with the federal government taking over the responsibility under the Constitution with exception of certain preventive measures in Municipalities and Local Authority Areas(14).

In 1963, with the formation of Malaysia, healthcare in the State of Sarawak was a Federal responsibility, whilst the state of Sabah retained its responsibility till 1970. 1971 marked the overall nationwide responsibility of the Federal government on health care management and delivery.

Although at the time of independence (1957), Malaysia had inherited a fairly appropriate medical and healthcare delivery system from the British, most of these services were most entirely URBAN, CURATIVE in nature with no public health programmes. There were also shortage of professionals, paramedics and auxiliary workers.

Post independence public healthcare facilities started with the implementation of the primary healthcare programme with the establishment of the 3-tier rural health programme of midwife clinic & house (*RBK-rumah bidan dan klinik*), sub-health and health centres in the rural areas as outreach health post for the population. The referral system provides referral of patients to existing district pavilion type hospitals in the sub-urban areas as 1st referral hospital. Medium rise hospitals of Penang, Kuala Lumpur, Melaka, Johor Bahru and Singapore (the former cities of the Straits Settlement).

Although the western maternity services with the Midwives Ordinance for the Straits Settlement came into force in 1917, the establishment of the first Maternity Unit in the Red Crescent Premises, Macalister Road, Penang with 120 beds in 1915 was earlier. Organised school of nurse – midwife also started in Penang Maternity Hospital in 1952 followed by Midwife Act in 1966 after Federal Midwives Ordinance 1954 was enforced. With the federal government taking toll of the nations healthcare and the demand for delivery care, maternity services remained the constant factor in the healthcare development and hence provided at all levels of care since then. The issue remains, however, when replacement of these facilities due to age and increasing workload came into being.

THE ISSUE

THE PROCUREMENT OF NATIONAL HEALTHCARE FACILITY DELIVERY SYSTEM

Procurement of any new or replacement healthcare projects were established based upon the review made on the five year Malaysia (development) Plans. The ground staff³ are required to put forward a request in the form of a proposal reports to the development officer of the State ministry of health office where the reports were vetted at State level for priority listing before sending for further vetting at the federal

³ Ground staff of the proposed or new adjacent facility, normally an executive officer in charge of development, will gather the necessary information on proposed development of the facility. The information will be written in a standard format as per EPU guideline and forward to the State office. The report will include salient features such as population, catchment, services existing and projected to justify the development with some costing.

ministry of health for listing, funding and implementation. Once secured, part of the project briefs was initiated from the state. These briefs entails only the salient physical and clinical requirements as basic justification to the Economic Planning Unit⁴ of the Central Agency⁵ on how the proposed development can contribute to nation building. For healthcare facility planning, standard practices require states or hospital designate personnel to furnish the Planning and Development Division, MoH, with a Situational Analysis report. It is from this report that the official Project Briefs or Medical Functional Briefs were formalised by the medical officers of the Planning and Development Division of the MoH being handed over to the Planning and Design Team (JKR/Consortium/PMC) for implementation⁶. In the process where time is limited and research are not able to be carried out extensively, planning to the needs of the actual users of that particular locality, despite the good indicators as far as physical health is concern, were seldom carried out in totality.

The procurement process, as practiced, goes on with the interaction of the planning and designing team with the 'client' that represents the ground users. Formalisation of needs were established for which the facility was constructed upon was freeze. New operational policies hovering at the time had to be waived to prevent variation to the project.

The outcome as portrayed in most post occupancy evaluation (poe) studies by the Planning and Development Division, MoH on new and existing healthcare facility projects were the gaps between what is needed and what is being provided. Hence extensions, added request for changes and adapted use were observed.

Pre 1990s procurement process, project briefs were given with a set of Schedule of Accommodation (SOA) for implementers. Although the SOA were a guide, it has become a contract and a constraint to the creative development of the project. Thus, post 2000, the project briefs, which were issued based on the generic number of hospital beds, were introduced. The generic brief only described the spaces needed and provide the optimum required numbers of spaces needed for salient activities based on the workload (as provided by the ground staff) of the particular location for

4 Economic Planning Unit (EPU) is the unit in the Prime Ministers Department Malaysia that deals with project vetting from the various ministries. The Unit is composed of both the cost and the technical section for which projects will be analyse for its relevance and viability to the national mission and its cost ascertained.

5 Central Agencies is made up various influential department within the government ministries that will collectively decide upon the national growth and development. The agencies include the Economic Planning Unit (EPU),Implementation and Coordination Unit(ICU), Public Services Department(PSD),the Treasury and Public Works Department.

6 Depending on the type of procurement contract, the project brief will be discuss and counter proposed by the planning and design team to an agreed scope of work within a stipulated time frame of planning, designing, construction and commissioning.

implementation. The briefs were very careful not to provide any sizes nor number of spaces needed to the requirements, leaving them to the so-called qualified person (planning and designing team that were made up of health facility planners, architects, engineers and equipment planners) to workout the actual sizes and facilities to function the facility.

On observations made on the process, the planning and designing team, with exception of a few, seldom takes up a proactive role to counter proposed or put up adequate proposals based on the current and future needs of the facility bearing in mind the real users- the patients, the staff, relatives and visitors.

For maternity services, being intrinsic in most new and upgrading facility projects, apart from what was stated in the design briefs, the underlying questions of care to the 'other' needs of well-patients and management such as workflow that include location of triaging area was seldom addressed. Once a facility is handed over on completion, it deems on the management to make changes to facilitate the process of patient care in the most acceptable manner to the locales.

The questions then arises: Perhaps the total period provided for the planning and design team were too short that everything has to be done simultaneously and in a rush; perhaps the planning and design team were not experience to pick up the requirement and provide alternatives; perhaps the brief given were limiting and not allowing any changes to accommodate the actual needs of the users on site; perhaps the changes in policies were too often and faster than a facility can be constructed; perhaps the whole situation should be working out on the idea of flexibility of use, change and construct...perhaps, perhaps, perhaps! The idea is never ending and should be explored. Healthcare facility is expensive and therefore it is imperative that the idea of closing the gap between needs and generic needs be realised and apprehended.

THE ISSUE OF APPROPRIATE MATERNITY SPACES

"...The labour rooms in most Malaysian hospitals and maternity units are air-conditioned. Such a cool environment is comfortable for the staff and mothers-in-labour. However, this is one of the common factors that resulted to hypothermia cases in Malaysian newborns. The sick newborns are prone to hypothermia because

of exposure during resuscitation when there is an insufficient warming facility or not enough precaution taken against hypothermia.

With better understanding of the importance of good teamwork in perinatal care, the perinatal community in Malaysia should work closer together during the planning of new perinatal units. In common working areas such as the labour rooms, input should be obtained from all personnel involved to enable the building of better working environment and facilities for the care of the mother-in- labour, the newborn infants and the accompanying fathers. The present widespread availability of computerisation should be utilised to develop a more reliable national system of perinatal data collection to help improve the perinatal and neonatal services in this country. The people are the most important asset of our nation. The provision of optimal perinatal and neonatal care will help ensure that the majority of the future Malaysian citizens are healthy and intelligent right from the early period of life”(13)

DEFINITION ON CONTEXT

Role of Maternity Care in Overall Healthcare System

WHO on the role of maternity care states: “Promoting healthy behaviours and increasing knowledge about pregnancy and pregnancy-related complications among women, families and communities are essential to the health and well-being of pregnant women. The immediate causes of pregnancy-related complications, ill health and death are inadequate care of the mother during pregnancy and delivery. More distal factors include women's subordinate status, poor health and inadequate nutrition. The health of pregnant women can be improved through effective antenatal care, which also increases a mother's chances of giving birth to a healthy baby. While any woman can develop complications during pregnancy and delivery, many such complications can be prevented or treated before they become life-threatening emergencies, and all can be managed by appropriately trained and equipped health care providers. Interventions that are beneficial to mothers help babies too.” (5)

Health Care Facility and Maternity Facility

Health care facilities often constitute the most visible part of a health care delivery unit and are often designated by the same names such as health posts, health centres, or hospitals. Facility or unit are frequently confused. The term, health care facility, means a building, or group of buildings, with the basic installations and

equipment...is a combination of resources (including personnel) designed to fulfil certain functions relating to people's health. The emphasis is on health care delivery units. (WHO (1985))(16)

The Ministry of Health Malaysia in their Health Facility Planning and Development report (1986)(14), page 11, states that Medical, health and dental services are delivered by a network of facilities of increasing complexities and sizes. Basic health care is being provided through midwife clinics or rural/community clinics (*linik desa*), rural dispensaries, health centres and urban polyclinics. Patients requiring more complex investigations or treatment are referred to a district or general hospital.

The Private Healthcare Facilities and Services Act 1998(9), page 10, interpret healthcare facility as any premises in which one or more members of the public receive healthcare services.

Merriam-Webster's Online Thesaurus of Encyclopaedia Britannica (2005) quote that "Maternity" (as a noun), is a hospital facility designed for care of women before and after childbirth and for the care of newborn babies.

In the MoH Malaysia health care, maternity services are part of the well-women⁷ healthcare services where 'patients' are monitored and assisted as a preventive, promotive and if need be, curative and rehabilitative measures. Maternity facilities covers the physical facilities according to the level of care i.e. from the Primary Care to Secondary care to Tertiary Care and vice versa. As defined above, the facility provided goes hand in hand with the services provided and how the service operates towards the delivery of care. Thus in Malaysia, the current physical facilities that relates to maternity care in various level of care are illustrated in Fig. 1:

⁷ Pregnancy is not considered as a disease. Thus it has been universally recognised as a condition affecting the well-women in their reproductive age. Health related to the state of pregnancy includes pre/ante natal including development during pregnancy and post condition/post natal of women's health for which they are tagged on clinic visits to be either low risk or high risk.

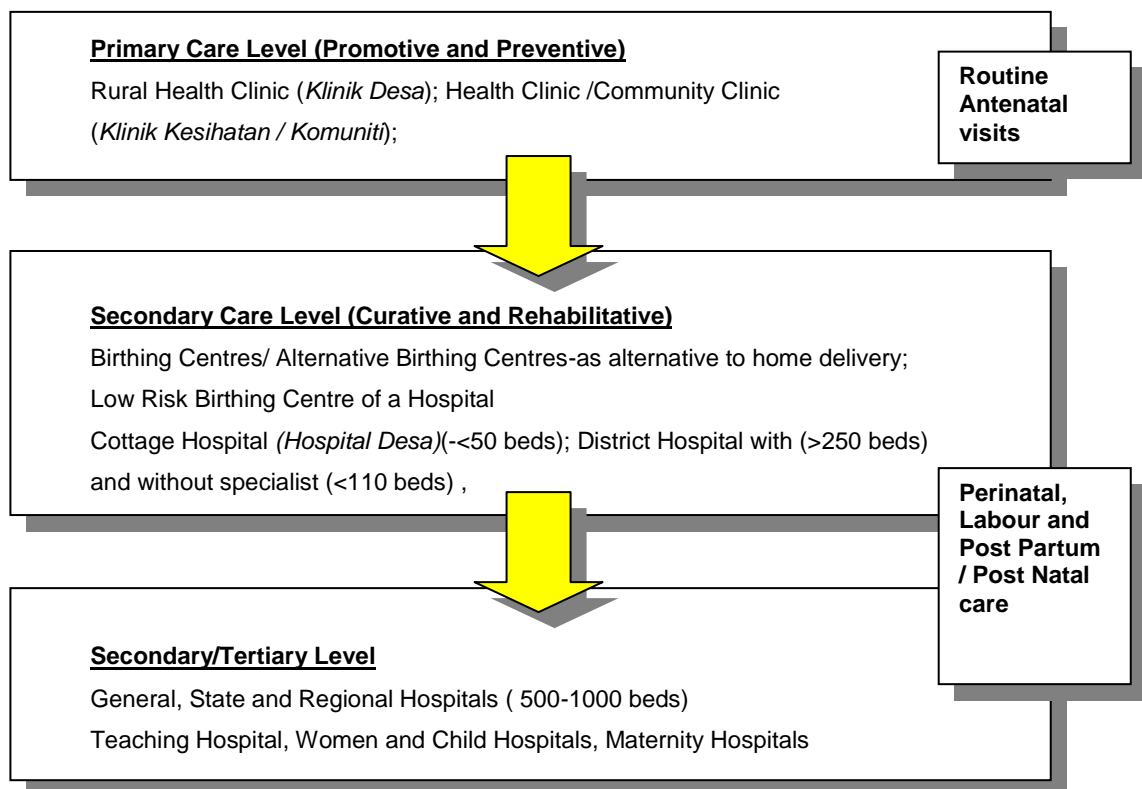


Fig 1. Maternity Care in the various level of care

Understanding the Maternity Healthcare Process for Pregnant Women

The facility to be designed for effective use need to comprehend the holistic nature of health care delivery system and how the physical environment may affect (for or against) its current and future course of actions. As defined by Meriem-Webster (10), when a woman is in a state of maternity or pregnancy⁸, she is required to undergo the health check process before and after childbirth. The facility designed should therefore able to accommodate these processes at the different stages of pregnancy and appropriate health care provision as illustrated in Fig.2.

Before childbirth includes the 7th –9th months or 37 weeks ante natal care⁹ 1-3 weekly visits by the mother to the primary health care / clinics (rural health, health centre,

⁸ Pregnancy is the condition of carrying a fetus in the body, from conception to delivery.

⁹ Antenatal care was first introduced to medicine in the first decade of this century. No one will doubt that it has brought immense benefits to women and their children. The purpose of antenatal care is to ensure, as far as possible, an uncomplicated pregnancy for the mother and the safe delivery of a live, healthy infant. Early attendance has always been stressed as an important element of ante-natal care, preferably in the first trimester. Such visits will allow early records of blood pressure, weight, haemoglobin and cardiac status, in case these should alter abnormally in later pregnancy. At such early visits too advice against exposure to pelvic X-rays or the taking of certain drugs in early pregnancy can be given. This is ideal; but even in the UK only 15% are booked before 9 weeks. Late booking is even more prevalent in Malaysia. (15)

maternal and child health centre or general practitioners) set ups before being referred for perinatal care¹⁰ at the choice hospital or birthing centres near home. The choice is dependant upon the state and tagging¹¹ of the mothers' pregnancy. For a referred admission, the mother will be located in antenatal ward prior to 'birthing' or in labour. Mothers in labour from home are admitted directly to the labour & delivery unit of the facility.

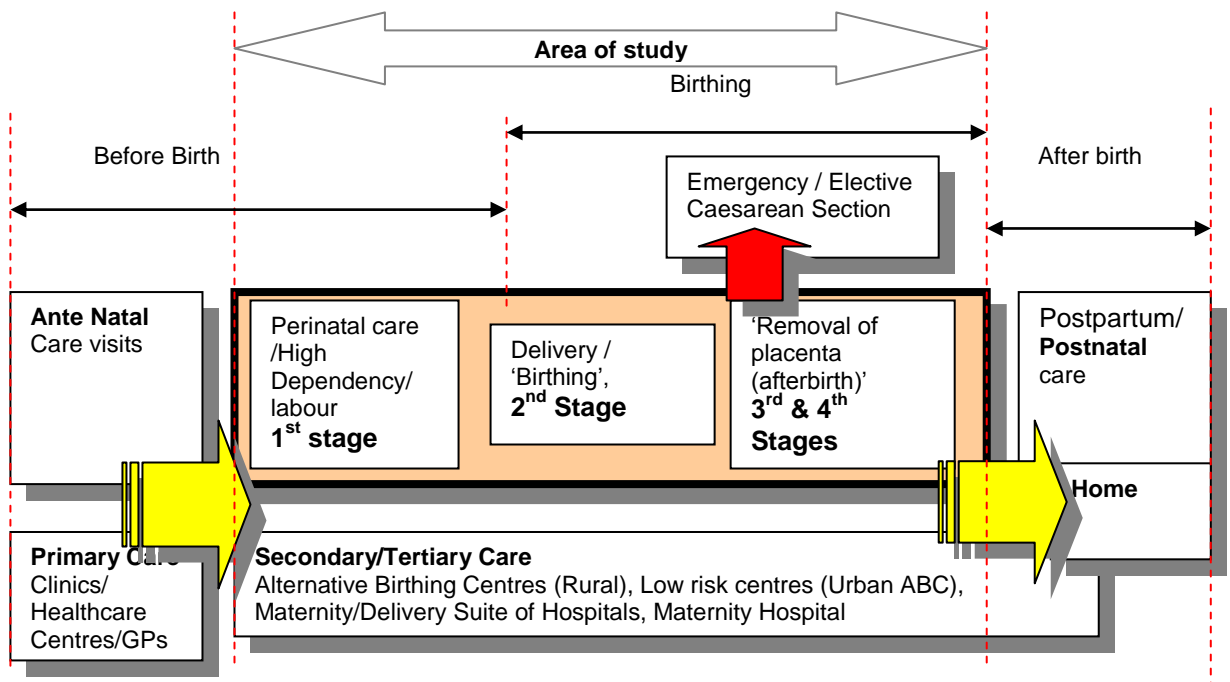


Fig.2 Relationship on stages of birth to facilities and level of care

During labour and delivery, the mother will undergo three processes in a certain span¹² of time. These processes i.e. 1st stage for labour, 2nd stage for delivery and 3rd & 4th stage –removal of the placenta (afterbirth) happened within the confinement of a Labour and Delivery Unit (LDU) or Delivery Suite. In cases where emergency caesarean need to be done, emergency operation theatre or dedicated caesarean operation theatre (OT) are used. The OT suites may be placed adjacent or at acceptable distant to the LDU facility.

10 Perinatal care is the care prior to birthing.

11 Mothers on their antenatal visits are tagged red for high risk and immediate hospital admission, yellow for referral to a doctor at health centre/hospital, green for refer cases to public health sister and white for home delivery.(11)

12 Depending upon the state of the mother, an average delivery may take between 1 to over 24 hours to deliver

After birth care or postpartum¹³ is also known as postnatal care. This stage of care is generally carried out in the post-natal wards of the maternity unit or even at home after 12 hours of observation and the mother and the baby is healthy¹⁴.

The National Operational Policies on Labour & Delivery Unit Set Up by Obstetric and Gynaecology (O&G) Services

Appendix 2 describes briefly in a circular provided to implementers, the national requirements of the Labour & Delivery Unit (O&G) set up for any level of care as of 1990. New requirements although in used, copies could not be acquired as yet. New requirements include the new formula of calculating the number of beds per population as well as number of birth to provide a better view on the maternity bed and LDR requirement for the said facility.

In concurrence to the O&G policies, the Planning and Development Division in their Hospital Planning: Current Norms and Guidelines (1998) had included the following for all LDU:

- Provision of individual delivery rooms. Attached toilet to be shared between two rooms.
- 50% of the L&D suites shall be equipped with the CTG machine which will be linked to a central monitor and hospital information system (HIS).
- Infant resuscitation equipment shall be provided in designated infant resuscitation areas.

On international grounds, the provision of Maternity facilities as a Unit in a Hospital or a stand alone Birthing Centres depends very much on the needs and expectation of one's country and culture. The article *Birth by Design* (2001) that studies the evolution of maternity care and midwifery services of North American and Europe, sums up the most important message of the book i.e. many would like to see maternity care become more woman- (and family-) "friendly" must consider all the social, historical, and cultural contingencies that design care at birth.

¹³ Postpartum care- The first 6 weeks after childbirth. There has generally been less attention paid to the role and content of postpartum care than to other aspects of maternity care. Yet a large proportion of maternal morbidity and mortality occurs during the postpartum period. Early postpartum care is essential in order to diagnose and treat complications, such as puerperal infections, secondary postpartum haemorrhage and eclampsia, which are major causes of postpartum mortality. Postpartum care provides an opportunity to check on the general wellbeing of mother and infant, and to ensure that the infant is feeding well. This is also a time to discuss birth spacing and different methods of contraception⁽⁵⁾.

¹⁴ From the interview of nurses and O&G specialist of Pekan and Kuantan Hospital 18 & 19th April 2005.

Refurbishment of existing facilities to meet the new demands such as comforting home environment with hidden hi-tech in child birth unit were also seen in the international projects such as the Maternity Centre of Ohio State University(4) as seen in Fig.3. Evolutionise existing facilities to meet less human resources, storage, but efficient utilisation of beds, may not be wasted by focussing on the needs of patients as seen in Fig. 4. The latter facility (Faulkner.J 2001))(7) address care as a holistic approach with the right balance of body, mind and spirit and thus provides a humane environment to humans.



Fig.3 LDR, Ohio State University Centre Unit (internet)



Fig.4 LDR, Utah Valley Regional Medical (Internet)

What is Labour & Delivery Unit of a Maternity Unit and What constitute spaces in the LDU

The activity of Labour and Delivery taking at home or at LDU as described by Merck (1999) is different for each expectant mother. Generally, the mother would like to have the husband to remain with her during labour. Encouragement and emotional support can help her relax from the pelvic pain she is experiencing whilst sharing the meaningful experience of childbirth in a family bondage. Another time, a mother may prefer privacy during labour or the father may not want to be present. A female relative is sometime preferable.

Although hospital birth is a common norm, there are some mothers who would like to have their babies at home. To provide this flexibility of choice without being detrimental to the mother's safety, Birthing Centres near home, equipped to handle normal and uncomplicated birth were established. Homelike environment that allows visitation from friends and family as well as fewer rules were the trademark.

Malaysia, with most normal deliveries being one of the 10 causes of admission to hospital, has embarked upon this mode of delivery since 1997(11) with the establishment of Alternative Birthing Centre (ABC) to decongest the LDU of the hospitals. The centre provides safe, supervised and appropriately managed deliveries for women who do not have any identified risks. It is an alternative to the hi-tech

hospital set up to facilitate deliveries as well as it provides access to the facility for those in the rural areas.

Common spaces in LDU include Immediate Entrance/ Drop off point, Relative Wait, Reception/Registration, History Taking/Examination/Assessment, Changing, Patient Lounge/ High Dependency Unit/Ante Natal (high risk), the LDR with ensuite toilet and baby bath (if not centralised), Baby Resus and warmer, Nurse Base, Clean Utility, Dirty Utility, Staff Change & Toilet, Staff Rest, Staff Change, Prayer Room, Storage for Linen, Equipment, Cleaners Store, Seminar cum Meeting Room, Doctors Room, Doctor On call room and Sister's office. Access to dedicated OTs only as required with its own suite; and maternity wards.

Importance of Understanding Flowchart of Patients from Admission to Discharge in LDUs in Space Planning and Space Provision

Facilities should be designed to facilitate the activities, so how does one understand the activities?

In most design briefs, a client should at least provide a flow chart on the activities proposed to occur in the planned facility whilst explaining the micro activities within the sub activities for designers and planners to perceive as adequate spaces. This is indeed important in a healthcare set up for each spaces account for many strict procedures for patient safety, legal measures and health outcomes.

With reference to Malaysian Health 2001(2002) as sampling on flow charts on Rural and Urban ABC, Appendix 3a and 3b requires the understanding on the language and terminology used to recognise spatial needs for each activity. These diagrams should include the spatial comprehension as envisaged that would facilitate the activity to occur as smoothly as possible. An example can be illustrated in the mention of registration where patients may come with the family. Thence at this instance the imagination of the scenario that accompanied the scene with wailing noise of children crying, the problem of bending down, the crowd and so on could provide the sense of space required for the simple activity.

Apart from understanding the diagrams, planners and designers on visits should records other related activities that supports the main activities such as provision of appropriate furniture or equipment, finishes, colour, number of personnel in one space, accompanying relatives, age group, culture, preferences. The needs of the

environment or situation such as privacy, partial privacy, light, view, thermal comfort and clinical requirement are also important.

The adjacent departments or functions not allocated under the jurisdiction of the medical-staff-in-charge should also be noted. Patient Care is the key word and the smooth running of the workflow should be able to override the management boundaries.

THE CASE STUDIES & FINDINGS

Case Studies

Case studies were LDUs and ABCs in the public sector. As actual visits were scarce, briefs and as-built drawings of the facilities chosen were among the cases studies use to confirm the spaces actually built to house the function. The choice is based on the level of care and availability of information within the period of study. The name of the facilities, as listed in the format in Appendix 4, were for ease of identification on the level of care-state, district, with or without specialist. The format is limited to some relevant information on spaces within the LDU only. Where possible mention of referral is made.

The hospitals and facilities referred are as follows:

ABC/ Low Risk:

Kuantan Hospital (Urban/refurbished)

District Hospital without Specialist

Setiu Hospital (new)

Pekan Hospital (new/replaced and old)

District Hospital with Specialist

Gua Musang Hospital (new/expand)

State/General Hospital

Sultan Ismail / Pandan Hospital (new)

Temerloh Hospital (new)

Alor Setar Hospital (new/replaced)

Penang Hospital (refurbished LDU)

Note: Kuantan hospital LDU and Old Pekan hospital is not included in the comparative list as it is considered not able to accommodate new requirements due to constraints of site and circumstances. It is however described as a report on observation.

Visits to facility were made to the following facilities based on their level of care and opportunity of visit. Other visits will be done post this paper for continuing research on the criteria towards appropriate spaces in maternity care and other.

They are:

District Hospital without Specialist: Existing and New Pekan Hospital

Maternity Units, General/State hospitals: Maternity Unit, Penang Hospital; Delivery Suite and Low risk Centre of Tengku Ampuan Afzan, Hospital, Kuantan

THE FINDINGS

Spaces in the Facilities

Findings from the briefs, drawings and visits showed that the facilities designed and built had not swayed much from the original requirements of the brief as far as spaces are concerned. The configuration of individual spaces provided to purported activity, equipment and environment could not be assessed, as they are not in used. Exceptions are the LDU and Low Risk Centre, Kuantan Hospital and Maternity Unit, Penang Hospital as they were in used.

Sizes of spaces provided in the new hospitals are in accordance to the brief. Innovations to the environment are basically cosmetic in nature in the use of new material, colour scheme and new equipment. New spaces compared to the older LDU are the room LDRs, spaces for central baby resuscitation, patients' lounges, staff area, prayer room within the LDU, the training facilities (for bigger hospitals with specialist) and dedicated OT (where necessary-according to workload). Spaces available are optimised for the said function as prescribed in the brief. No additional space without a good rationale is provided. Function such as Azan room is seen only in the older hospital where it combines with other functions. This function thus could also be integrated within the privacy of LDR spaces provided against the older design of cubicle LD rooms or wards.

Although the requirements indicate that the facility should be father / relative friendly, spaces provided can still be improve to accommodate not only the standing person but also the whole person with other tasks besides waiting and assuring the mother. Studies in other parts of the world include spaces for spouse to do work or other members of the family to be together. Perhaps the MoH can relook at the policy on the duration allowed per patient to stay in the LDR or LDRP that may require more space per room to allow for more function as support to the birthing mother.

Privacy remains the question during birthing as staff come and goes in and outside of the LDR. Curtains provided within (as seen in Penang Maternity Unit) were able to avoid from being seen right through when husband are allowed in for other patients. Spaces in older refurbished hospital, due to its structure were not able to provide adequate space for the function (Fig 5). Perhaps, the location and the positioning of the bed could be made so that both the patient and the care giver can have the best of the occasion without endangering lives of mother, babies and the care-giver.



Fig.5 Penang LDR

The Staffs

Generally support staffs on enquiry were not fully aware what entails appropriate spaces for maternity unit per se. Most staff make do with whatever spaces available within their jurisdiction and manage other required spaces as shared areas with other supporting and adjacent units/departments. There were instances that they are not fully informed of what they are getting in the new hospital especially in managing the many-roomed spaces with a small number of staff.

The patients and visitors

Maternity Unit, Penang Hospital

Although both the ante & postnatal wards are occupied, the maternity unit of Penang is low in its occupancy in comparison to other states due to alternative choice of

birthing in private hospitals. Cases as far as Kedah come to Penang as a regional referral centre. There is no low risk centre required, as they do not need for such facility in Penang. Observation made on visits, also allow relatives to enter the newly refurbish LDU on the ground floor. Patients from antenatal ward have direct access to the LDU, but after delivery, they have to go through a common corridor to enter the post-natal ward.

Kuantan Hospital

The study was not able to interview the patients and visitors as to their reaction to spaces provided. From observation, they are satisfied with the facilities provided as the low risk centre of Kuantan that allow them free access by the families at almost any time in comparison to the LDU where it is quite inaccessible and provide no rooms for visitors. Spaces in the refurbished OPD for the Low risk centre is more than adequate as the centre is located within the hospital ground and is accessible to the OT if required through a dedicated corridor via the Ambulatory Care Centre (ACC). The LDU on the 1st floor remain as per designed. Visitors need to ring a bell to enter the premise or enquire on the status of the mother. There is no proper waiting area. Waiting is done at the lift lobby. Antenatal or postnatal patients come and go at the common corridor with no privacy.

SUMMARY

‘Adequate spaces’ for the provision of maternity spaces in any healthcare or any nation is quite relative. Studies found that it depends on the country practices, the micro culture and work culture of the users-patients and care-givers/staff. Standard optimum spaces (not size) based on activities remain although it may be adapted according to how the staff are used to or trained to. New policies need to be accommodated to existing physical structures. Natural changes were made to ease without much thought to the future requirements as long it suffice the ‘circulars’ such as father friendly or baby friendly policies.

Primarily, planners and designers may base upon the generic spaces of requirement provided to start the process of design. However, in the process of planning and design, it is inevitable that the responsibility to check upon actual needs on site apart from added understanding of workflow becomes critical. For healthcare projects, space means more than a 3 dimensional site. It needs to meet many other

requirements not able to discuss in this paper, in order to support the well being of patients and the staff, as care givers, 24 hours a day.

For maternity care, the patients are well patients and the moment of birth is a celebration for the family and perhaps sadness to some. Spaces required may overcome even the former clinical requirement of sterility to homelike environment and access to family. Although, in reality, designers and planners may face lack of support due to time constraints and others, initiative and recognition of its importance for the future of another human being, should be continuously worked upon.

On a serious note, the requirements of the patient spaces must be reciprocal to projected admission based on population of the catchments area, history of admission cases and influence of available expertise or diagnostic/treatment equipment. Spaces for staff in terms on mode of management and optimum human resources (as per safety guideline-WHO, MoH-quality assurance) available and projected human resources as well as level of expertise /competency should be considered.

Whatever the future may bring, as planners and designers for a humane environment, the least one could do is to imagine and visualise the future and act on it immediately for a clear conscience.

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PRIMARY AND SECONDARY DATA FOR THE STUDY TOWARDS APPROPRIATE MATERNITY SPACES FOR PUBLIC HEALTHCARE FACILITIES

Secondary data includes the following:-

1. from the World Health Organisation (WHO) on the definition and concept of
 - (i) maternity care from world view and the 'South Asian' or Asia Pacific Region of the WHO where Malaysia is located.
 - (ii) referral system on level of care (from primary care to secondary care to tertiary care)
 - (iii) health care facilities and local context
2. from the Ministry of Health Malaysia (MoH) Annual Reports and Malaysian Department of Statistic (online) for the following statistics :-
 - (i). on the population distribution throughout the country,
 - (ii) male and female population percentage,
 - (iii) productive age group in the population pyramid nationally and by states
 - (iv) birth rate by states and the its five year trend
 - (v) number of health facilities with maternity care
 - (vi) number of birth by ethnic group in public healthcare
3. from the Ministry of Health Malaysia for the historical development of the maternity services and facilities;
4. from project and design briefs formulated by the Ministry of Health Malaysia
5. from drawings of maternity / labour & delivery unit of new and existing hospitals
6. from private consultants and the public works department
7. from the literature review of international and local related books and journals.

Primary data includes

1. from the Ministry of Health Malaysia (Planning and Development Division) onsite interview from the Medical Services Planner or Doctors and Nurse Planner in charge;
2. from interviews and observation of the selected hospitals visited i.e. Maternity Unit of Penang Hospital; Old and New Pekan Hospital, Pahang;

Low Risk Centre and Labour Delivery Unit of Kuantan Tengku Ampuan Afzan Hospital; and Maternity Ward of Jempol new hospital and Port Dickson Hospital as case studies.

3. personal experiences in planning and design as well as vetting hospitals and primary healthcare projects while in service as architect in the Public Works Department of Malaysia (JKR), the Ministry of Health Malaysia and as Health Facility Planner (Medical Planner) consultant for over 20 years.