EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA
A RETROSPECT OF NATION BUILDING FROM PRE-COLONIAL TO TODAY

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Malaysia has its own inbuilt history of evolution of healthcare facilities designs from the traditional to contemporary mega structures we witness today. Each design has its own story foretold the epidemiology phenomena, capacity and inspiration of a developing nation. From simplistic idea of housing aspects of health in single isolated buildings to complex structures that needs reviewing towards a sustainable future. The pictorial presentations briefly explore Malaysian public healthcare facilities from its humble beginnings in nation building from pre-colonial to what it is today. The objective is to provide ideas on the basis of why and how these designs were pragmatically evolved through time, to professionals, allied disciplines and users. Both qualitative and quantitative methodologies were adopted for this continuing research. Primary and secondary data, through literature review, observations, random interviews, post occupancy evaluations and hands-on experiences, were utilised. The significance of this presentation includes a sense of importance to the role of individual players in the healthcare services, construction industry, the trust that our Creator, and humanity had conferred on us, towards contributing and sustaining a healthy and hence a ‘wealthy” nation.
THE OUTLINE

Introduction
Malaysia - the country, Health System and Health Status – pre colonial, colonial and post independence
Evolution of Public Healthcare Facilities Designs to health trend in nation building
- Primary care
- Secondary Care
- Tertiary Care
- Special Institutions

Summary

Conclusion
INTRODUCTION

IN BRIEF
HEALTHCARE ARCHITECTURE

Crisp (1998) defines provision of healthcare architecture as a concept of a life enhancing environment, as a place built or created to support and sustain the well being of the particular occupant of time, place and culture, where the body as a whole, both inner and outer, is regarded as essential to how the space is experienced. She further described that our bodies articulate our relationship to the world around us where how we perceive spaces relate directly to body size, its acuity, range or motion and intentions - i.e. ergonomics, will eventually dictate how we move through space as well as interacts with its geometric forms and sensory stimuli. This movement defines our realm in specific environment or place and place emphasis on our five senses of see, hear, smell, touch and taste as fundamentals in architecture.
HEALTHCARE ARCHITECTURE

Healthcare / Medical Architecture addresses healthcare function with users as the very core of its creation.

- To consider the people they house and shelter to get well are not infected by the very convergence of all the sickness they harbour at the inception.

- To focus on creating spaces and environment for users. Thus sustaining the complete balance that could constitute a healthy organisation vis-à-vis human management and its human based facilities.

With its technicalities, good architecture is a fundamental issue addressing the environment, culture, needs and definitely clinical requirements.
WHAT ARE HEALTH CARE FACILITIES?

Healthcare impels the provision of a wide variety of buildings, to serve many different functions and accommodate the whole life span of man. 

“From cradle to grave”

“From Womb to Tomb”

Shelter is needed for the promotion of health and the prevention of sickness, for assisting natural functions like childbirth, for curing disabilities and repairing malfunctions and for supporting the afflicted and incapacitated.
This shelter may fall into a number of generic types. Although medical knowledge is largely international, the ways in which it is applied and in which it is delivered in one country and another are likely to differ, as are the forms of building appropriate to the particular circumstances.

The forms reflect the nature of the organisation, culture, economy and geography of their respective situation and the peculiarities of their social microclimate.
HEALTH CARE FACILITIES

There are no universal solution for the provision of healthcare facilities.

It is **dangerous to generalise** but it is reasonable to make a broad distinction between the facilities available or provided for between the developed and the developing world.

The differences are most noted in the religious beliefs, in social attitudes, the physical and cultural infrastructure, climate, availability of manpower for staffing and the financial resources to initiate and maintain the running of the facilities.
DESIGNING HEALTHCARE FACILITIES

- Time, spectrum of life
- Place/location/geography
- Affordability/cost
- Culture/people/belief system/ethics
- Technology – medical, non medical
- Resources – manpower/staffing/provider
- Epidemiology, lifestyle
- Infection control/Safety/Privacy
- Clinical function
- Aesthetics – balance/proportion/healing/5 senses

TARGET USER AND TIME FRAME

The target user
The would be retirees

Event, experience,
Technology exposure, dreams,
needs......

1950’s ...world war II, 1st Man on the
Moon, TV, Computer era, nuclear power,
Tsunami, high rise structures, etc..

THE FACILITIY

THE BRIEF
REQUIREMENTS

From 56 years old to......

Normal ageing
Sick state
Healthy/exceptional

1950’s
Planning, design, construct

56 years old and above
Average old age for man 72 yrs old
Average old age for women 80 yrs old

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA-NMN
The 3 main levels are usually termed as PRIMARY, SECONDARY and TERTIARY.
NATIONAL REFERRAL

The nation has to serve its people and it has to reach out to be able to reach them.

The primary care system and facilities has been set out to take that function to ascertain and filter them prior to them being referred to hospitals.
DISCUSSION

The paper discusses the approach of health planning in relation to the physical provision of healthcare facilities, pre and post independence to date.
MALAYSIA - THE COUNTRY, HEALTH SYSTEM AND HEALTH STATUS - PRE COLONIAL, COLONIAL AND POST INDEPENDENCE

HEALTHCARE FACILITIES DESIGNS

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA-NMN
MALAYSIA – THE COUNTRY

26.6 Million Population of Malays, Chinese, Indian Indigenous, Other with 2 million working immigrants from Myanmar, Indonesia and Bangladesh
(2006 MoH)

Islam, Buddhist, Hindus, Christians, Other

Healthcare 6.33% of National Budget

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA-NMN

17
STATES OF SABAH AND SARAWAK
## HEALTH STATUS PRE AND POST INDEPENDANCE

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<td>Male (years)</td>
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<td>64.0</td>
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<td>27.1</td>
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<td>Crude Death Rate</td>
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<td>4.8</td>
<td>4.6</td>
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<td>4.8</td>
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<td>Maternal Mortality Rate (per 1000 livebirth)</td>
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**Table 1: Vital Statistics for Malaysia, 1957-1998, 2010**  
Source: Department of Statistics, Information and Documentation System Unit, Planning and Development Division, Ministry of Health Malaysia
**Evolution of Public Healthcare Facilities Designs to Health Trend in Malaysia**

**Pre Colonial Period**
- 1700-1957
  - Simple structures
  - Tropical Architecture
  - Non Standard
  - Single, low rise sprawling structures in small towns and medium rise in capital cities

**Colonial Period**
- 1700-1957
  - Standard Architecture
  - Design for Nation Building
    - Hospitals
    - Clinics
    - Support Services
    - Staff residence
    - Medical & Nursing schools

**Early post independent period 1957-1970s**
- Upgrading works 1970s-1990s
  - High-rise, High-tech, art décor, post modern, retro, urban based, smaller land lots for Bigger Hospitals

**Conventional Procurement**
- Package Deal Procurement

**Upgrading Works**
- Late 90s-early 2000s
  - Customised Architecture
  - Design for Nation Building
    - District Hospitals
    - Clinics
    - Support Services
    - Staff residence
    - Teaching facilities

**New Standard Architecture**
- Design for Nation Building
  - Single, low rise sprawling structures in small towns

**Greening Healing Environment Up-grading, customised design building 2007-todate**
- Home-based

**Greening Healing Environment**
- High-rise, High-tech, art décor, post modern, retro, urban based, smaller land lots for Bigger Hospitals

**5yrs x 1,2,3,4,5,6,7,8,9.. Malaysia Plans +50yrs**
- 1957
PRE COLONIAL PERIOD

Colonial Period
1700-1957

Pre Colonial Period

Post independent period
1957-1970s

Mid 1970s-1990s

Medical Tourism
After care Hospices

PRIVATE HEALTHCARE (URBAN BASED)

Home-based

Simple structures
Tropical Architecture

Non Standard
Single, low rise sprawling structures in Estates/Plantations

medium rise donation based hospitals in capital cities for the poor

1957

Cooking

Shops change to hospital

Customised design for hospitals

More GPs Clinics
Pharmacies
Laboratory Services
X ray services
Teaching (Medical/Nursing schools)

New Hospitals
(Maternity/Chinese)

GPs (Clinics)
Support Services
Nursing Homes

Integrated within commercial Centres for GPs, Nursing homes with the suburbs

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA
PRE-COLONIAL/TRADITIONAL
ERA
HEALTH CARE FACILITIES DESIGNS

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA-NMN
HISTORY AND TRADITION

Not much has been written on the existence of healthcare facilities pre colonial that belongs to the cultures of the indigenous people, the Malays, Chinese and Indian traders.

The tradition of healing embedded in these cultures are still home based, in the streets and in shop lots as Sing Seh.

IN THE MEDICAL OR CURATIVE SERVICES SECTOR

Health or preventive services sector physical development was very slow in 1930-1939 due to economic depression.

The health sector was basically managed by respective sanitary boards of the municipality in the states and companies of the plantation estates until 1958 when the federal government of independent Malaya took over.
ISSUES WERE BIRTH, INFECTIOUS DISEASE, SANITATION, FOOD.....

Maternal and child health

In the first decade of the 20th century, infant mortality rates continued their upward trend. In the urban areas of the Straits Settlements, they were in the region of 200 per 1,000 live births, rising to over 300 per 1,000 in 1911. The rates in the rural areas were lower, about 150 per 1,000 live births. Infant mortality rates collected at this time were largely estimates, possibly with considerable underreporting of deaths in the first few weeks after birth, particularly in the rural areas.

INDICATIVE STATISTICS

BERIBERI ADMISSIONS TO GOVERNMENT HOSPITALS (‘000 POPULATION OF FMS)

MALARIA ADMISSIONS IN RELATION TO AREA UNDER RUBBER CULTIVATION

ESTABLISHMENT OF PUBLIC WORKS DEPARTMENT (PWD)

The political changes from 1786 until 1909 to accelerate the development in the Straits Settlement and the Malay States urged the specialised department to be established to undertake infrastructural development.

The event following the formation of Public Works Department (PWD) in India in 1854, lead to establishment of PWD for the whole of the Straits Settlement that was sanctioned through an “Engineer Establishment” in 1856.
HUMAN RESOURCE

Similar to the healthcare sector, the specially personnel inherited by independent Malaya were generally expatriates.

Citizens were sent abroad to study as part of the human resource training programme to serve the country..........meantime work went on with the limited resources.
The Federated Malay States (FMS) of Malaya had its first hospital built in Penang from 1874 by the British East India Company, driven by the tin industry that require healthy workforce. Hospitals built between the periods of 1883-1910 provide only curative services and were generally urban based.

At the turn of the century there were 34 hospitals in the FMS of Malaya.

By independence (1957), Malaya inherited 10 major general hospitals and 56 district hospitals with specialise personnel being British expatriates.
Hospitals and health centres were generally customised one-off design.

The healthcare architecture was a typical tropical architecture that addressed the climatic requirements extremely well.

The general hospital of Penang, Sultanah Aminah of Johor, Sarawak General Hospital, Queen Elizabeth Hospital of Sabah and many district hospitals are still in use today.

Their purported ‘standards’ were addressed in the building details as well as the quality of workmanship in the construction.
MALAYSIAN HEALTH VISION

“Malaysia is to be a nation of healthy individual, families, and communities, through a health system that is equitable, affordable, efficient, technological appropriate, environmentally adaptable and consumer friendly, with emphasis on quality, innovation, health promotion and respect for human dignity, and which promotes individual responsibility and community participation towards an enhanced quality of life”

Ministry of Health Malaysia
HEALTH-VISION

The health vision is not static but dynamic that sets in place framework to ensure that the health system could develop and adapt to the changing environment.

Health care facilities were pragmatically plan and developed to provide the support towards that vision.
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<td>RM (million)</td>
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<td>145.0</td>
<td>189.4</td>
<td>213.7</td>
<td>377.2</td>
<td>588.4</td>
<td>750.0</td>
<td>2,253.0</td>
<td>2,658.0</td>
<td>5,578.0</td>
<td>10,710.0</td>
<td>na</td>
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<td>% social sector</td>
<td>23.5</td>
<td>20.0</td>
<td>12.2</td>
<td>7.9</td>
<td>9.2</td>
<td>16.7</td>
<td>13.4</td>
<td>5.0</td>
<td>5.4</td>
<td>na</td>
<td>na</td>
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</table>
Since independence Malaysia has placed a cost-effective interventions in health care. The establishment of basic public health and essential clinical services was phased in over time and all the geographic areas. In 1970s, government provide emphasis on health services in the rural areas where 75% of the population lived.
INTRODUCTION

Primary care ......

The hospitals small and large, on the other hand has been built at speed to fill out the gaps between the primary care and the tertiary care hospitals at areas

✓ That needs to have the facility;
✓ to replace old dilapidated ones and
✓ to accommodate expansion as well as change in the policies to existing ones.
INTRODUCTION

On the **macro level**, the paper relate on the **national referral system** then, in place and in the process of planning;

On **micro aspect**, the design development of these healthcare facilities were discussed on the rationale of its development as outcome of the country’s health trend.
HEALTHCARE FACILITY

“...means any premises in which one or more members of the public receive healthcare services..”

Part 1, Preliminary, Section 2. Interpretation, Private Healthcare Facilities and Services Act 1998

Proposed HUKM teaching block
Damansara Arkitek
WHAT IS GOVERNMENT HEALTHCARE FACILITY

…” GHF Means any facility used or intended to be used for the provision of healthcare services established, maintained, operated or provide by the Government but excludes privatised or corporatised Government healthcare facilities;”
Government / Public Sector 75-80%

Private Sector 20-25%

FEDERAL GOVERNMENT
- Public health/medicine
- Disease Control
- Law Enforcement

STATE/LOCAL GOVERNMENT
- Environmental Sanitation, Housing Standards, Implementation, Law enforcement

PRIVATE HEALTH CARE FACILITIES
- PRIVATE HOSPITALS
- GP CLINICS
- DENTAL CLINICS
- ESTATE & MINES HOSPITALS
- CLINICS IN FACTORIES & INDUSTRIES
- PHARMACIES & CHEMISTS
- LABORATORIES
- X-RAY SURGERIES
- OTHERS

Min. of Health
Armed Forces
Dept. of Aborigines
Min. of Home Affairs
Min. of Education

Source: Ministry of Health Malaysia
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<tr>
<th>Level</th>
<th>Primary Care</th>
<th>Secondary Care</th>
<th>Tertiary Care</th>
<th>Long Term Care</th>
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<tr>
<td>Type</td>
<td>Promotive, Preventive, Curative</td>
<td>Curative</td>
<td>Curative, Rehabilitative</td>
<td>Home/Palliative/Terminal Care</td>
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<td>Built facilities</td>
<td>Midwife/Rural Health Clinic</td>
<td>Cottage Hospital 20-70 beds</td>
<td>National Referral Centre of Excellence</td>
<td>hospices</td>
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<td></td>
<td>Dispensary / mobile Dispensary</td>
<td>Non Specialist Hospital 70-150 beds</td>
<td>Teaching hospitals – public and private</td>
<td>elderly/retirement homes</td>
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<td></td>
<td>Health post</td>
<td>Specialist Hospital 150-350 beds</td>
<td>Research institutions - Institution of Medical Research (IMR)</td>
<td>Special Institutions – Rehabilitation</td>
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<td></td>
<td>Flying Doctors</td>
<td>Private Hospitals</td>
<td>Organ based hospitals Cardio Thoracic Eye Hospital (Private)</td>
<td>cancer, leprosarium, psychiatry</td>
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<td></td>
<td>Health Clinic /Community Clinic</td>
<td>Specialist Hospital 350-550 beds</td>
<td>- Specialist Hospital 550-750 beds (State /Regional)</td>
<td>nursing homes</td>
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<td>Private GPs</td>
<td>Infectious Disease (CID) Support Facilities</td>
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<td>cerebral palsy centres</td>
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<td>Infectious Disease</td>
<td>Public Maternity Homes</td>
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<td>public health / school /dental</td>
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MALAYSIAN HEALTHCARE REFERRAL SYSTEM (THEN)

Normal referral

- Health Clinic
  - With and without Alternative Birthing Centre
- Community Health Clinic / Rural Health Clinic

Secondary Care

- Small District Hospital
  - 50-300 beds
- Medium District Hospital
  - 300-500 beds
- Large District Hospital
  - 500-750 beds
- State/General Hospital
  - Not more than 1000 beds
- National Referral Hospital
  - Just over 1000 beds

Tertiary Care

- Emergency referral

Evolution of Public Healthcare Facilities Designs to Health Trend in Malaysia - NMN
MALAYSIAN HEALTHCARE REFERRAL SYSTEM (NOW-2000 ONWARDS)

- National Referral Hospital/Specialist Hospital (Major)
  - +700 – not more than 1000 beds
- State /Specialist Hospital (Major)
  - +500-700 beds
- Specialist Hospital (Minor)
  - +200-500 beds
- Non Specialist Hospital
  - +50-200 beds
- Health Clinic
  - With and without Alternative Birthing Centre
- Community Health Clinic / Rural Health Clinic
GEOGRAPHICAL DISTRIBUTION OF SELECTED HOSPITALS

- National Referral Hospitals
  - Regional Hospital/State/Specialist hospital (major)
  - Tertiary / Secondary State Hospitals
  - Specialist Hospital (major)
From rural simplicity of needs to urban refinement on demand
COLONIAL ARCHITECTURE

Clinics at Hill Station
Still in use at outpatient care (public)
Non standard
Tudor architecture, masonry with timber framing, rectangular planning

Fraser’s Hill Clinic
Rural & Urban Based

THE CONCEPT

Accessible

Architecture is utilitarian, modular, easily assemble, fast and simple to construct.

Easily identifiable, blend with site context and address cultural undertones

Towards nation building reaching out to the rural population

RURAL CLINIC (60-70S)

Timber Structure with pitch
Asbestos free roofing panels
Raised floor on stilts
Clinic and Community Nurse house under one roof, Later version separated into different units for different function.
Natural ventilation
Daylight
RURAL CLINIC (80s)

Batang Kali Type
Timber and Masonry Construction
Pitch/Tile Roof
Filled Raised floor
First building to use modular coordination dimensioning system
Clinic is separate from community nurses house
RURAL CLINIC (2000S)

CONCEPT
Facility under one roof, easily maintained, less acreage

2 version:
Clinic with 1 quarters attached
Clinic with 2 quarters attached
HEALTH CENTRE
BEETLE TYPE PLAN MODULE

Toilets

Consulting cum Exam / or family planning for MCH

Dispens-ary space

Consulting cum Exam

Waiting area

History taking

Main Entrance


55
HEALTH CENTRES (60S-70S)

Pavilion Modules that made up the Main Health Centre which a HSC or HC can be upgraded to.
HEALTH CENTRES

Healthcare facilities designs
HEALTH CENTRES 70-80S

Mantin Type

Gulau Type

opd
mch
dental
X ray
HEALTH CENTRE-URBAN

URBAN POLYCLINIC –
THE MAK MANDIN TYPE

Clinical and support areas
Waiting area cum circulation
Main entrance

Concept layout plan of Mak Mandin Type Urban Polyclinic/GOPD

The Kajang Type KK3 (revision of Mak Mandin Typed) Design
HEALTH CENTRE-URBAN
TYPE 2-PRE RM 8
>500-800 TOTAL ATTENDANCES PER DAY

Kangar Health Centre

Kota Bharu Health Centre

Standard design for medium rise health clinic on tight site.

E V O L U T I O N  O F  P U B L I C  H E A L T H C A R E  F A C I L I T I E S  D E S I G N S
T O  H E A L T H  T R E N D  I N  M A L A Y S I A-N M N

By JKR Malaysia
HEALTH CENTRE (90S)
TYPE 1-PRE RM 8

Seremban Klinik Kesihatan
One Off Design- by Arkitek MAA

>800 total attendances per day
HEALTH CLINICS (2000S)

- Towards refinement of needs
  - Air condition areas
  - Disease pattern

Meeting urban needs and sustainable issues of building material
  - RC frame, concrete tiles, brick infill

Land Issues
Energy Issue
Low rise sprawl, medium rise dense, standard and customise
Add-ons, refurbished, new
From tradition, post modern, to high tech
PUBLIC HOSPITALS IN MALAYSIA

Hospital design development in Malaysia could be described as design developed

- prior to independence
- and after independence.

In each period the planning and design concept varies as they were subjected to conditions and specific requirements of the situation.
PRE INDEPENDENCE

There were no hospitals prior to the colonisation era.

The treatments of the ills were by traditional means of faith healers and traditional medicine.

The design of hospitals came about in the 19th Century with the earliest being established in the cities of the Straits Settlement i.e. Penang, Melaka, Johore Bahru and Singapore.
PRE INDEPENDENCE ( >1957) .. EXCERPTS

“.........at the end of 1886 which comprises of a general ward for officials and members of the public who could pay the prescribed fees, and four wards for indigent patients (‘the pauper ward’) where treatment was free”

“The average number of patients in the general ward was 24 and in the pauper wards were 182.”

JM Gullick, 2000, A History of Kuala Lumpur 1856-1939, MBRAS Ch.7 - Health and Environment
“Death rate in the general ward was less than 6% whereas in the pauper wards it was almost 20%. ....”

“The medical report on the Pauper Hospital in 1891 records that out of 3200 patients admitted to the hospital during the year, 19 died in admission room and 54 more died within the 24 hours of admission.”

PRE INDEPENDENCE ( >1957)..EXCERPTS

“Expansion of Government hospitals continued until the 1890s with higher priorities given to the improvement of environment and reducing the incidence of serious illness in the establishment of the Kuala Lumpur Sanitary Board or the first Municipal body in the Malay States.”

PRE INDEPENDENCE ( >1957)..

….. hospital designs of pre-independence can be categorized as the pavilion,
- low-rise or the *pauper hospitals*;
- The high-rise general hospital; and
- Special institutions.

...the Colonial Architecture Designs
COLONIAL ARCHITECTURE

Pavilion type
Pitch roof 2 tiered high angled ceiling
Raised from the ground
Verandah all round
Access via verandah
Good passive design

Penang Hospital
COLONIAL ARCHITECTURE
PAVILION LOW RISE EUROPEAN & ‘PAUPER’ HOSPITALS

The European Hospital at Bangsar with imported equipment to serve the European community

Pauper Hospital /
Tan Tock Seng Hospital, Singapore-funded by wealthy Chinese for the poor

Estate Hospitals for immigrant plantation workers

PAVILION LOW RISE ‘PAUPER’ HOSPITAL

Tanglin Hospital

General Hospital Kuala Lumpur
COLONIAL ARCHITECTURE
PAVILION LOW RISE ‘PAUPER’ HOSPITAL

Ipoh Hospital
Labour and Delivery Unit

Old Kuantan Hospital

Taiping Hospital

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS
TO HEALTH TREND IN MALAYSIA-NMN
Colonial Healthcare Facilities
In urban areas

Penang Maternity Hospital

Cameron Highland Hospital

Kuantan General Old Hospital
COLONIAL HOSPITALS

Melaka General Hospital

In big cities:
Medium high rise hospital for inpatient areas, natural ventilation, long
overhang, thick wall, windows all around, high ceilings, brickwork, load
bearing and reinforced, up-hang open wide windows, sun-shading, lifts
and staircases
Sprawl/low rise support building.

Sultanah Aminah General Hospital
POST INDEPENDENCE

Post independence hospitals are planned and designed to the specific requirements of the locality such as the
✓ catchment population,
✓ disease trend,
✓ age groups;
• the national requirements on the level of care appropriate for that locality with regard to specialty such as basic services and specialist services
• its network of services.
• National agenda such as..the caring society..
POST INDEPENDENCE

Hospitals design after post-independence can also be classified as

Standard Design or Type Design,
One-off/Non Standard Complete Hospital,
Redevelopment and upgrading,
One-off/Non Standard Component Design.
TOWARDS NATION BUILDING & MEETING WHO ‘HEALTH FOR ALL’ BY 2000

The Design and Construction Concepts
• Standardisation template design for different component of a hospital for new and upgrading (add-on) works.
• Standard hospital by bed numbers and services
• Natural ventilation and mechanical fans
• Pitch roof, louvred windows, covered corridors
• Decentralised medical gas
• Centralised other services
• Low rise, no deep plans. open 4 beds bay areas
• Standard specification
STANDARD PLAN OR DESIGNS

Standardisation was quoted by MoH as an approach in implementation of health facility projects as very effective in the Malaysian context together with a Normative Approach in planning.

MoH also quote that,

“As coverage with health facilities improved, facilities for new facilities had to be assessed more stringently. Existing standards need to be reviewed/evaluated from time to time to take note of new technologies or approaches in the delivery of health care ”
STANDARD DESIGN OR TYPE DESIGN,

Banting Hospital

the government need to built most public buildings at reasonable cost, reasonable speed and of acceptable design standards with less mistakes as well as easy to be supervise by others

The Jerteh Type Hospital 100-150 bed hospital

+45 acres

Sik Hospital
JERTIH TYPE NON-SPECIALIST HOSPITAL
90-150 BEDS (60S-70S)

Low rise finger like pavilion hospitals. Buildings designed for different service function but linked by covered corridors. At the time of design, no centralised medical gas was installed as a policy.

No first class wards. All wards were naturally ventilated /with mechanical fans.

Structure-frame structure, bricks and asbestos free/ concrete tile roof.
Air Con areas were OTs, CSSDs, administration office,
KUALA BERANG TYPE NON-SPECIALIST HOSPITALS (80S)

Revised design from Jertih Type.
Individually designed building form specific purpose and connected through covered corridors.
ALTERNATIVE

The tremendous pressure to built within a shorter time to meet needs, drove JKR towards privatization of certain projects.

Previous Malaysian Plans, where JKR’s capacity was not able to meet demand of the clients, JKR will outsource portion of design or implementation work process to private consultants.

The scope of work outsourced to the industry were architectural services for basic design; civil and structural design for basic design; and quantity surveyor for tendering and post tender administration.
In 4th Malaysia Plan (1981-1985), JKR continues the implementation of physical facilities development of health centres (HC) and upgrading works to existing facilities.

However, two main hospital projects were procured through turnkey procurement method. These were the 750 beds Kuala Terengganu State Hospital and 500 beds Teluk Intan Hospital. While KT hospital was based on standard but modified plan for hospital with one-off customised design. This moved starts the subsequent procurement using turnkey and design and built for large projects.
THE CONCEPTS OF MID 90S

Transitional period....towards patient focus care and healing environment

Decentralisation of outpatient

Presence of day care services

Privatisation of maintenance, catering, linen, security, housekeeping and engineering services

Introduction of Information Technology

Automation (pneumatic system)
NUCLEUS HOSPITAL MALAYSIAN CONCEPT (1990S)
MALAYSIAN NUCLEUS (TROPICALISED)

Flattened the land, long corridors, added perimeter corridors.
Add toilets at the ends, .......

E V O L U T I O N  O F  P U B L I C  H E A L T H C A R E  F A C I L I T I E S  D E S I G N S
T O  H E A L T H  T R E N D  I N  M A L A Y S I A - N M N
LANGKAWI HOSPITAL (1995)-SWEDISH

Skanska-pamara jv
DISTRIBUTION HOSPITAL (1990S)

Slim River Hospital (200 beds)
Medium rise
JKR Malaysia

Aisyah K (2007)
DISTRICT HOSPITAL (EARLY 2000S)

Kepala Batas Hospital
150-200 beds
Alternative Medicine
Teaching hospital for USM

Juhari & Hashim Architects Sdn Bhd
RECENT HOSPITAL ARCHITECTURE
2005

One off design, generic brief for 150 bed hospital
Low rise sprawling and interconnected corridors
Courtyards, gardens, wide corridors, wide overhang
Sun shading screen, overall natural ventilation and air conditioning at clinical areas
NEW DISTRICT HOSPITAL (CUSTOMISED)

Jempol Hospital, Negeri Sembilan
Post modern cum tropical architecture
Interior, Courtyard with landscape gardens
Colour scheme, better finishes
RECENT HOSPITAL ARCHITECTURE 2005

SETIU HOSPITAL, TERENGGANU (PAB, JKR)
Is not “a standard plans” but design that was conveniently used for fast construction.

However

- it cannot extend/expand, or
- Do not address local culture

1. Seremban
2. Ipoh hospital
3. Klang hospital
4. Kota Bharu, Kubang Kerian Hospital
5. Kuala Terengganu Hospital
6. Kuantan hospital
STATE HOSPITALS (70-80S)

Kuala Terengganu Hospital
800 beds

Kuantan Hospital
800 beds

Typical Layout plan
T –Shape tower
On Podium
REDEVELOPMENT HOSPITAL PROJECT - MID 90S

Melaka Hospital
Sarawak General Hospital
Taiping Hospital
Muar Hospital
Kajang Hospital
Kangar Hospital
Kota Bharu Hospital
Sultanah Aminah Johor Bharu Hospital
Queen Elizabeth Hospital, KK
Sg. Petani Hospital

..more
Labour Delivery and Ward Block
Room addition Sultanah Aminah Hospital, Johor Bharu
REDEVELOPMENT HOSPITAL PROJECT - LATE 90S

Ambulatory Care Centre (ACC) establishment at State hospitals

Kuantan Hospital
UPGRADING OF HOSPITALS – 9TH -10TH MALAYSIA PLAN

WOMEN AND CHILDREN HOSPITAL to STATE HOSPITALS

COMPONENT (OT, WARDS, ACC BLOCK, etc) to existing hospitals

Women & Children block, Seremban hospital
(Majubina website)

Women & Children block, Kuala Lumpur Hospital
(internet)

EVOLUTION OF PUBLIC
HEALTHCARE FACILITIES DESIGNS
TO HEALTH TREND IN MALAYSIA-
NMN
Centralised, decentralised, network, Changeable
Medium to high rise

EVOLUTION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN MALAYSIA-NMN
From larger hospitals to smaller intensive and acute hospitals

Patient Focus Care

Towards IT
LARGER HOSPITALS

Kuala Lumpur Hospital
3000 beds

Sprawling, low rise Le Corbusier style architecture with
Large overhang, wide corridors, deep fenestration
Off concrete construction, ramps and daylight
1ST PAPERLESS HOSPITALS

Selayang Hospitals 800 beds
Medium Rise Sprawling Tropical Architecture
(Radicare Sdn Bhd)
CUSTOMISED-ONE OFF HOSPITALS

Hospital Putrajaya, 200 beds (IT hospital)
Inclusive Design
Green/low energy-passive design consideration
Seismic consideration
Use of IBS in the construction
GENERAL HOSPITALS

FROM LARGER HOSPITALS TO SMALLER INTENSIVE AND ACUTE HOSPITALS TOWARDS ITS PATIENT FOCUS CARE
RECENT HOSPITAL ARCHITECTURE 2005

Post modern tropical architecture with wide overhang, high tech covered drop off point
Large lobbies, corridors
Short walking distance
Energy conscious
Daylight, natural ventilation
Courtyard and landscape gardens
Better finishes
Patient focus

ARCHITECT & MEDICAL PLANNING:
Perunding Alam Bina Sdn Bhd

TEMERLOH HOSPITAL
450 beds
Opens 2004
RECENT HOSPITAL ARCHITECTURE

Landscape as integral, enhancing component of the hospital

TEMERLOH HOSPITAL

Architect & Medical Planning: Perunding Alam Bina Sdn Bhd
RECENT HOSPITAL ARCHITECTURE

Ampang Hospital
450 beds (Itaac Architects Sdn Bhd)
Deep plan, tight site, medium rise, Pitch roof, short distance, daylight, courtyards
RECENT HOSPITAL ARCHITECTURE

Atrium, lobby of glass and steel
Landscaped garden

Ampang Hospital

E V O L U T I O N  O F  P U B L I C  H E A L T H C A R E  F A C I L I T I E S  D E S I G N S
TO HEALTH TREND IN MALAYSIA-NMN
Recent Hospital Architecture

Modern, use of materials and forms to reflect technological advances. Use of large central courtyard for daylight, ventilation and focal point. CTH

Sultan Ismail Hospital (Pandan Hospital) Johor Bharu, Johor (600 beds) Partly operationalised

GDP Architects, Medical Planning: PAB
SULTAN ISMAIL HOSPITAL (PANDAN HOSPITAL) JOHOR BHARU, JOHOR (600 BEDS) PARTLY OPERATIONALISED
GDP ARCHITECTS, MEDICAL PLANNING: PAB
RECENT HOSPITAL ARCHITECTURE

Serdang Hospital
500 beds
First steel composite hospital in the country.
(Outpatient Entrance)

RECENT HOSPITAL ARCHITECTURE

Atrium / Spacious Lobby and waiting area
Plenty of sunshine/day light
Extensive gardens
Customised design interiors

Serdang Hospital
Outpatient waiting area and lobby
( Teaching hospital for University Putra Malaysia)
RECENT HOSPITAL ARCHITECTURE

Concourse/ Lobby
Shops/Cafeteria
Public Amenities
Main Entrance
Natural Ventilation

RECENT HOSPITAL ARCHITECTURE

Sg Buloh Hospital
600 beds
Traumatology
Throughout the ages
History brought along
Psychiatry/mental hospitals of Bahagia in the Northern region and Permai in the Southern region of the peninsular. Sabah and Sarawak each has its own facilities.

Infectious disease-Leprosy had its own centre being the oldest in the country in Sg.Buloh and so as the
Respiratory Centre or Tuberculosis Unit in Kuala Lumpur Hospital

Medical research institution is the oldest

Other institution presently emerge is Centre of Excellence such as the Heart Institute, The Cancer Institute and the latest The Rehabilitation Hospital
MEDICAL RESEARCH INSTITUTION
SPECIAL INSTITUTIONS

Radiotherapy Unit, HKL
Le Corbusier style Modern Architecture
ABM

Cardio Thoracic Unit
Tropical Architecture
PAB

Proposed National Cancer Centre
NATIONAL CANCER INSTITUTE

High tech
Energy conscious
Daylight
Sustainability
Healing environment
NCI (National Cancer Institute) - As above but linear development due to site constraint

Perunding Alam Bina Sdn, Bhd
From history of Chinese hospitals for the poor, the estate hospitals and the missionary hospitals

Catering for company personnel and foreign expatriates

..now Medical Tourism beyond Asia
PRIVATE SECTORS IN THE INDUSTRY

Island Hospital, Penang

Miriam Hospital, Penang

Upgrading and expansion
PRIVATE SECTORS IN THE INDUSTRY

Mahkota Medical Centre, Melaka

Damansara Specialist Centre

Tower and podium, atrium/lobby, cafeteria, shops, Services Outpatient (general and specialist) and Inpatient
New, One Off and Readaptive reuse to customise building typology
HOME, PALLIATIVE & TERMINAL CARE FACILITIES (NON-GOVERNMENT)

Non Standard design, governed by Private Hospital Act (then) and now Private Healthcare Facilities and Services Act

Strand Hospital and Retirement Home
Throughout the ages, healthcare architecture is synonymous to clinical/medical planning requirements first prior to positive enhancement towards healing environment, passive energy or value added amenities.

The physical make up on each of the facilities, i.e. structural grid, choice of structure, space configuration, materials or finishes is wrapped around the provision of needs and balance to cost.
SUMMARY

The short study shows 3 distinct style of architecture adopted within the period based on rural or urban location i.e. (contextual)

- The tropical simple architecture based on traditional Malay house on stilt or raised above ground
- Post modern /classical cum art décor cum colonial architecture with heavy masonry base
- High-tech, glass and steel cladding light architecture of robotic and automation
SUMMARY

Generally almost all designs have Courtyards, gardens, access to the outside, thin configuration for wards and deep plans for Diagnostic and Treatment zones

All entrances are distinct and accessible

All facilities were redecorated by staff as they use to do upon occupying.
Whether it is high-rise, medium rise or sprawling pavilion, design of inpatient areas had changed many times to provide the patient with better environment, shorter travel distance to treatment and amenities, within affordable space, cost and priorities.
SUMMARY

Procurement method has direct implication on the design choice.

Complex design usually comes as a lump sum in either turnkey or design & built

Generally:

- New Standard plans – conventional
- Refurbishment - conventional
- New One Off design – Turnkey, Design and Built, Negotiated, Public Finance Initiatives, Public Private Partnership.
The Challengers to Health and Facilities to Match

Among others
Infectious Diseases
Emerging Disease to facility design
Geriatric / Elderly Facilities
Green rating /
material / Sustainability / Life Cycle Cost
Flexible architecture
Quality
Maintenance
Turn over of staff at workplace with experiences
Training facilities for specialisation few and inconsistent
Career path for those interested unclear
Dynamic, volatile
IN CONCLUSION

FROM 1st Malayan Plan in 1957 ...... to the 9th Malaysian Plan (2006-2010) in the realisation of Vision 2020 and now The 10th Malaysian Plan (2010-2015....) Malaysia is to quickly transformed....
ON FLEXIBLE ARCHITECTURE

Despite New One Off Designs that customise needs and demands of a particular hospital, ..”Standard Plans” had played and will continue to play a very important role in the development of healthcare infrastructure to the population.

While One Off Designs addressed the locality identity and the pressure of today’s technology demand generally in the urban areas, “Standard Plans” may continue to be important for rural clinics, health post, or dispensary i.e. in remote areas where infrastructure is a problem, through standardized components or easy assembly of the components by locals.
ON FLEXIBLE ARCHITECTURE........

As encouraged to the use of IBS technology and method of construction, Standard Plans can be and should be innovatively designed as a flexible smaller modules so as to be environmental friendly to where it will be sited, without the need to cut and fill the site nor cutting down trees to provide space for its erection.

Standards design as smaller modules of clinically tested, may be synthesised as One Off Designs akin to its site, environment and locality.

One Off Designs, Type Designs and Standard plans have be to reviewed constantly not only on its physical design and requirements of spaces but also to address the socio-cultural values as envisioned in Vision 2020 for a caring society.
ON HUMAN RESOURCES

However, due to inadequacy of qualified human resources in healthcare facility planning and design, the Ministry of Health Malaysia had initiated on generic briefs as basis for hospitals and health centres as the brief of requirements for the volatile industry...

that too require constant reviewing, to upkeep with medical discovery and technology and other emerging challengers.

Training in healthcare facilities/hospital planning, design and maintenance need to be carried out as a ritual/tradition/induction for all new staffs (for all disciplines) involved not only in the process but also in the operation and evaluation,
ON QUALITY

For architects and planners on the job, ...

......do plan and design the projects entrusted to them with a conscience....try not to keep to the minimum standards available or copy from available ‘standard drawings’ or ‘standard details’ to embark on a new or upgrading projects without analysing its appropriateness.

We need to constantly learn the bigger picture of health and its implication in order to place whatever we are dutifully assigned.
Malaysia like other countries are moving forward...the Ministry of Health Malaysia had gone further ahead with the Vision towards

**Smaller Hospital**
- Emphasis on acute care
- Emphasis on Ambulatory Care
- Network of Hospitals
- IT Ready
- Promote wellness
- Smart and intelligent environment.green
- Customer focused
- People and community friendly
- Flexible & Caring
- Accessible, Integrated , Affordable.......more

**IN HEALTHCARE FACILITIES DESIGN FOR SUSTAINABILITY..**
EVOULATION OF PUBLIC HEALTHCARE FACILITIES DESIGNS TO HEALTH TREND IN NATION BUILDING
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