Consideration for a building design

Understanding the landscape

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Emerging Paradigms in Healthcare

India's transformation span

Economic Transformation

- Per capita income had risen from $281-1991 to $1,942 - 2016
- India's share in global GDP doubled from 2.5% in 1980 to 7.0% in 2014-15

Demographic Transformation

- Urbanization
- Fragmented family system
- Ageing

Social Transformation

- Change in lifestyle
- Change in food habits
- Youth- renewed appetite for knowledge and information

Improvement in healthcare over the years…..

- More health awareness
- Better educated citizens
- Higher proportion of babies born under medical supervision
- Decrease in life threatening and crippling Communicable diseases
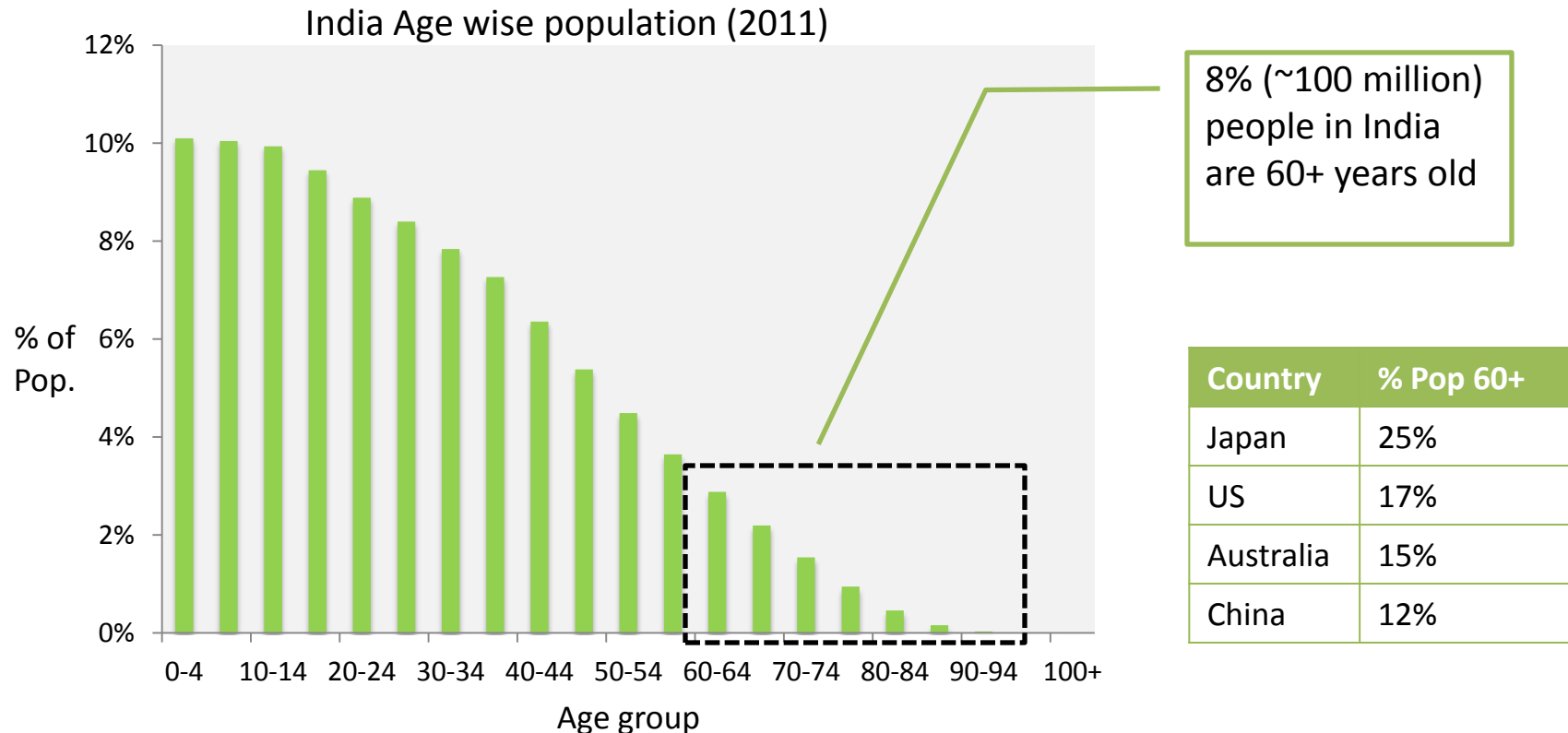- Higher child immunization rates

Has this transformation touched every one in our society?

Number of people living on less than $1.25/days (millions)

Region	1990	2005	2015
East Asia & the Pacific	873.3	316.2	137.6
China	683.2	207.7	84.3
Europe & Central Asia	9.1	17.3	9.8
Latin America & the Caribbean	49.6	45.1	30.6
Middle East & North Africa	9.7	11.0	8.8
South Asia	579.2	595.6	403.9
India	**435.5**	**455.8**	**313.2**
Sub Saharan Africa	297.5	388.4	356.4
Total	1,818.5	1,373.5	947.2

The Elderly need comprehensive care to address Chronic conditions

India Age wise population (2011)

8% (~100 million) people in India are 60+ years old

Country	% Pop 60+
Japan	25%
US	17%
Australia	15%
China	12%

Acute care will only restore stability, but improving quality of life needs comprehensive care

Non-communicable diseases are growing in India

Per capita Income (Development) →

Africa | India Pakistan… | China Vietnam… | USA, Japan W Europe…

Communicable

Injuries

Non Communicable Diseases

40 % | 60% | 75 % | 89 %

Increase in Non communicable Diseases →
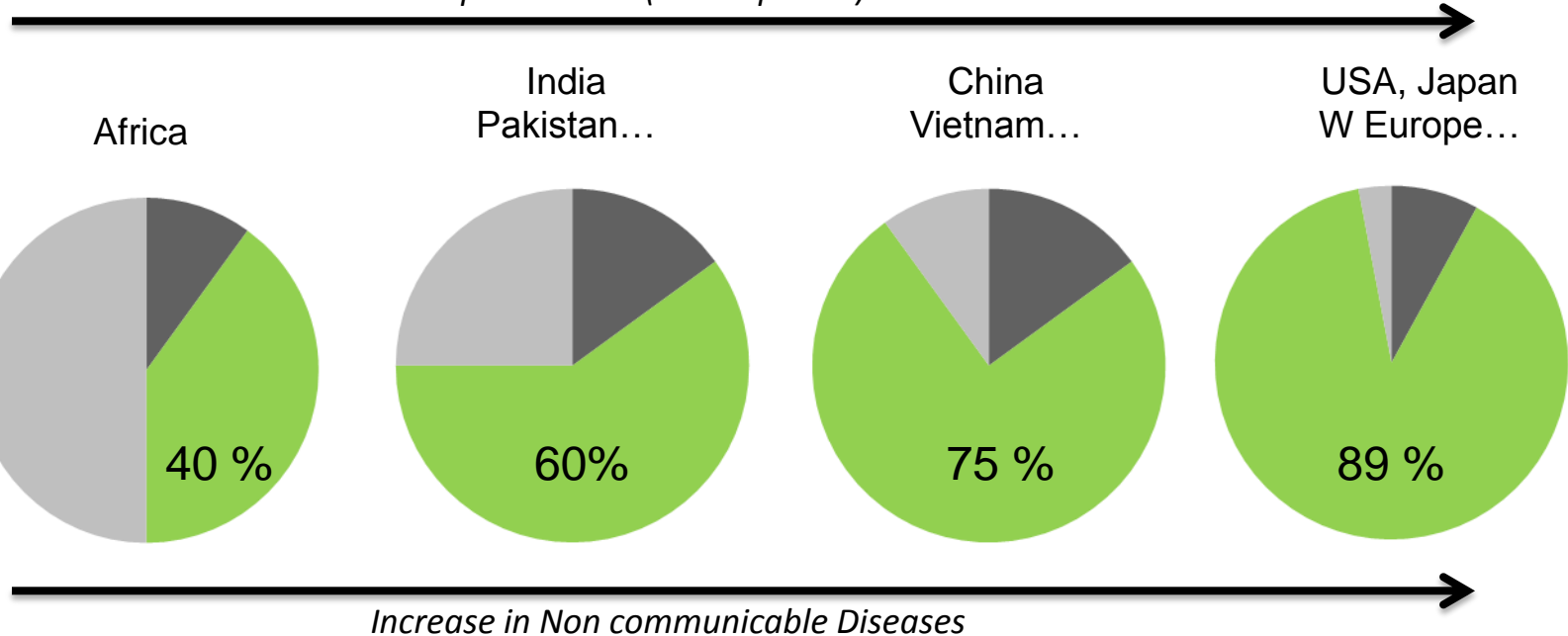
Major non communicable diseases: Cardio Vascular Diseases, Diabetes, Cancer and Chronic Respiratory disease, injuries
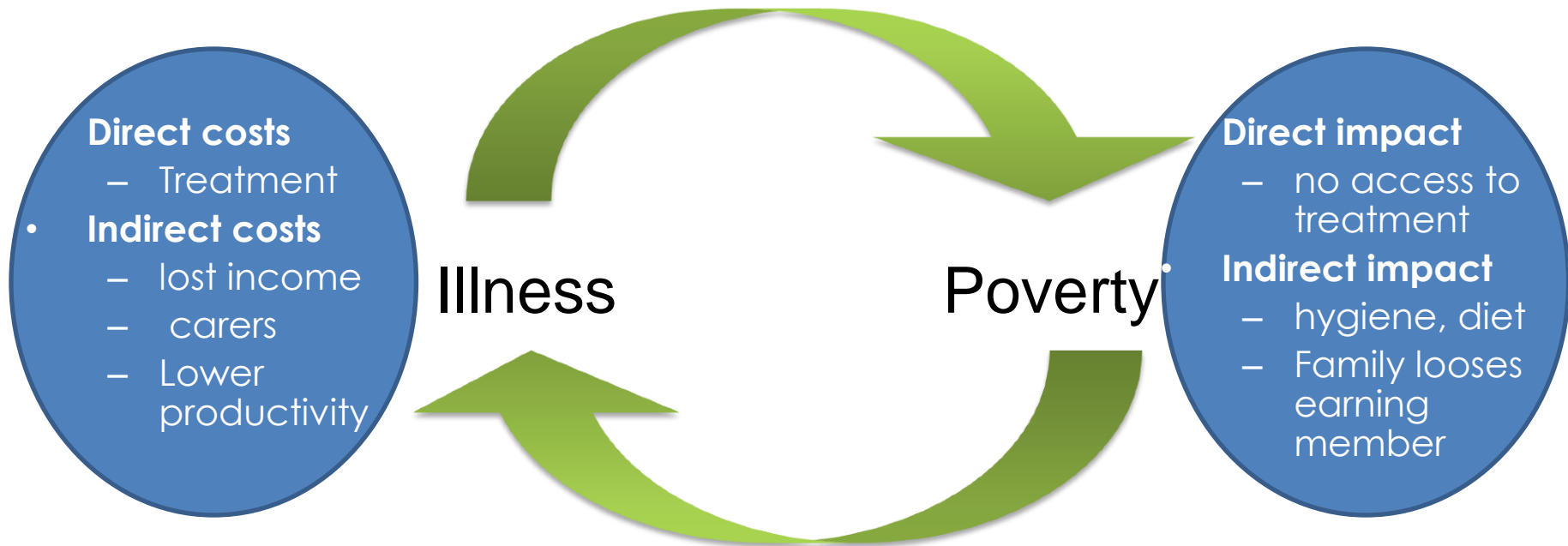
As India's economy grows, age and life-style related diseases will increase

Most NCD patients loose mobility/occupational skills
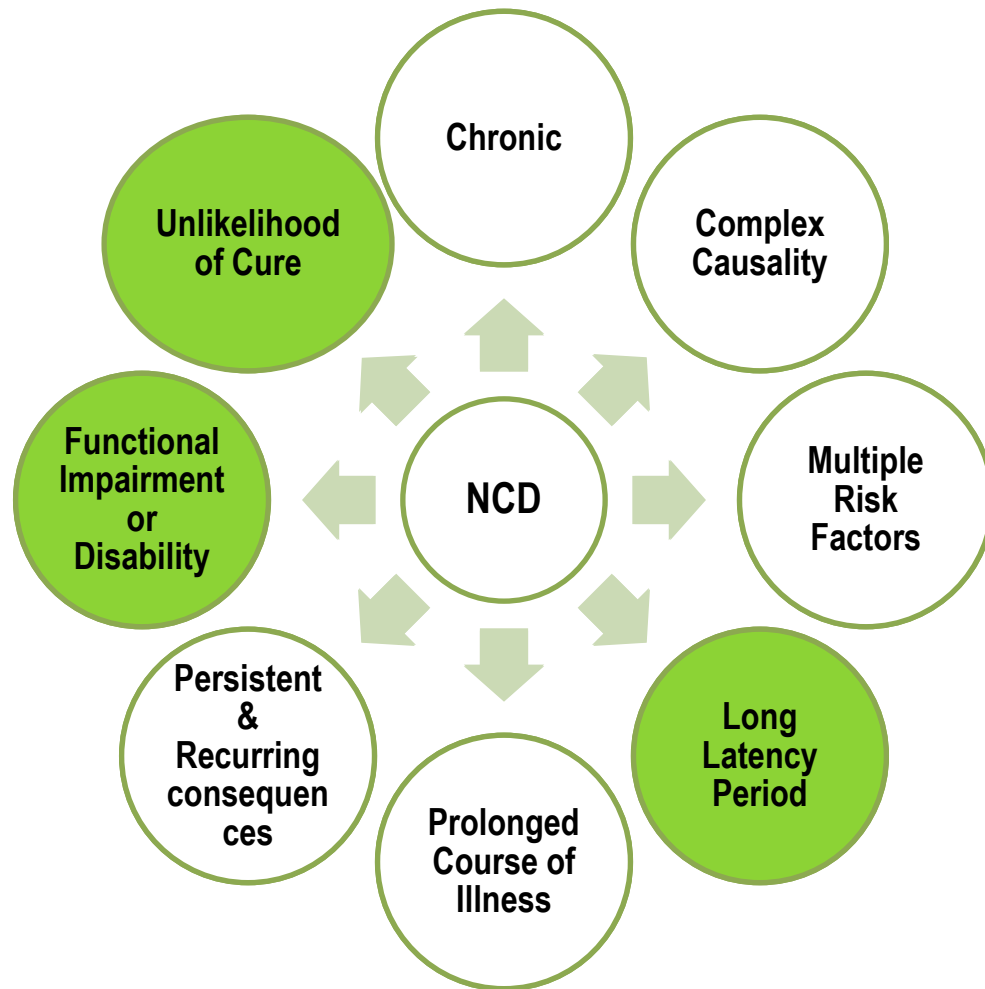
- Acute care for cannot restore mobility and occupational skills in majority

Loss of Mobility and Occupational skills leads to economic loss

Direct costs
– Treatment
- **Indirect costs**
– lost income
– carers
– Lower productivity

Illness

Poverty

Direct impact
– no access to treatment
Indirect impact
– hygiene, diet
– Family looses earning member

Emerging trends

Rapid progress in technology

Increasing penetration of insurance

Accreditation – Mandatory

- Electronic Medical records
- Changing treatment modality

Changing Patient expectations

Changing employee expectations

The Formidable Challenges...

Increase in Non communicable diseases
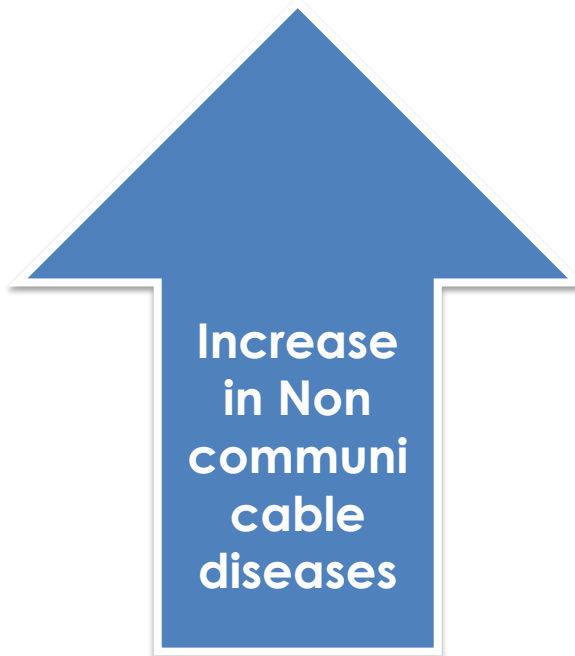
Access to healthcare at some areas still being unsatisfactory

Increase in trauma and accidents

Rise in the medical cost

Singapore , Kerala, Tamil Nadu & Odisha Comparison

	Singapore	Kerala	Tamil Nadu	Odisha
Area (sq km)	712	38,863	130,058	155,820
Population (m)	5.18	33.38	72.14	41.97
Literacy rate (%)	92.5	93.91	80.33	72.87
GDP per capita (US$)	51,855	2,270	2,502	1,149
Life expectancy at birth (years)	82.14	75	66.2	59.6
Infant mortality rate (per 1000 live-births)	2.32	12	28	51
Maternal Mortality Rate (per 100,000 live births)	3	66	90	235

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Source : nrhm.gov.in , Indexmundi.com

Factors that influence infrastructure

Institutional setting

Need in the community
Determining the Scale
Tertiary/Secondary

Private Setting

Single/Group practice
Capacity of doctors
Ability to invest

Scope of services

Added surgical facility
Day-care/inpatient load

Location of the hospital

Accessibility
Suitability of the land
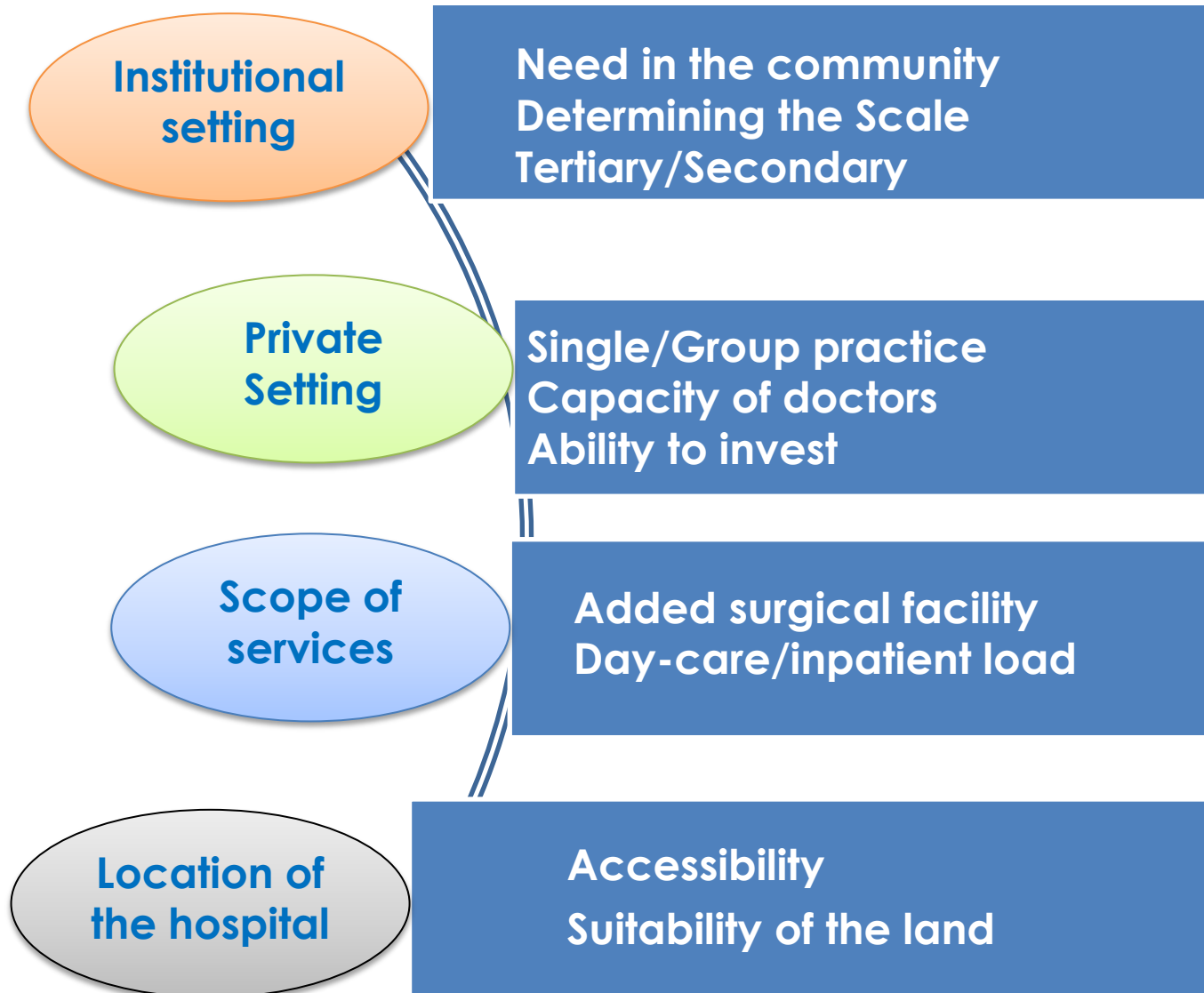
Hospital Physical Infrastructure

- Vision
- Site selection
- Building layout
- Statutory requirements
- Equipment planning and procurement

Hospitals for the Future

As science and medicine progress, so should healthcare architecture and interior environments

- **All Encompassing Infrastructure**
  - Life enhancing designs: blend of art and science
  - Green buildings
  - Technologically advanced facilities
  - JCI and NABH accreditation standards

Vision for Physical Infrastructure

- Appreciating culture is key to understanding functional flow

- Building should project image of efficiency and friendliness, not extravagance

- Provide ideal layouts to partner to serve as guide

- Patients should be able to move in a logical flow with minimal assistance

- Allow for innovation in design to accommodate new geographic areas, cultures, and expectations

- State-of-the-art, energy-efficient facilities
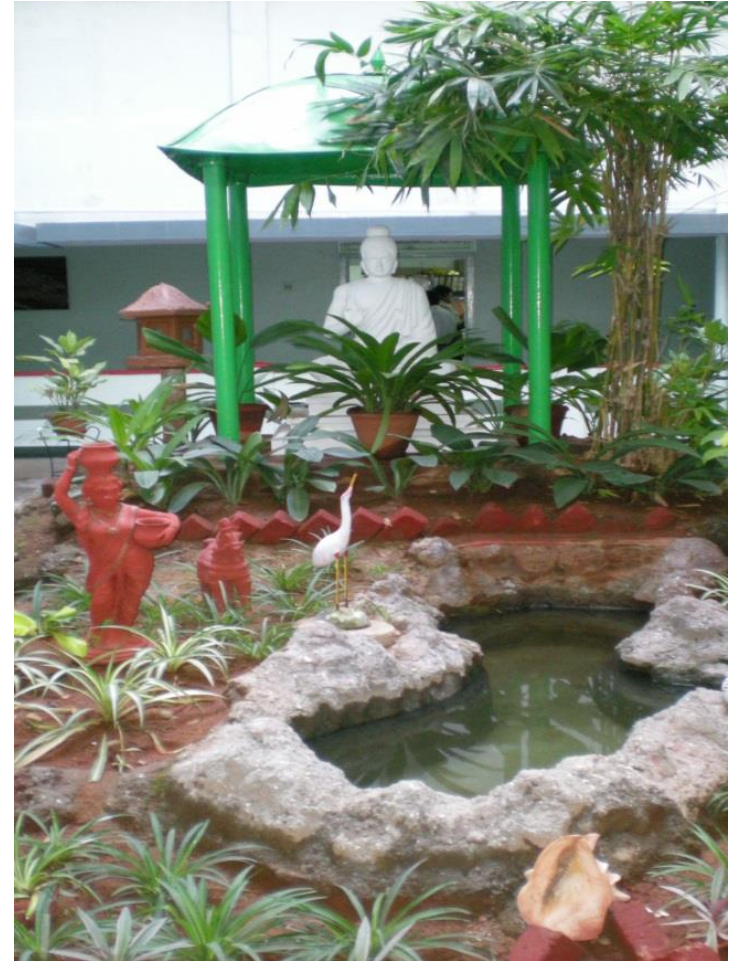
Courtyard, Madurai Hospital

Site Selection Considerations

Physical Conditions: Soil Elevation Water Table Expandability (vertical and horizontal)	**Utilities:** Electricity Sewage Telephone Water
Accessibility and Availability: Roads; Easements Public Transportation Manpower Catchment Comfortability (qualitative)	**Verification:** Price assessment Lease or Buy decision Ownership documents for verification Mortgage Status

Building Planning Guidelines

Aravind Eye Hospital, Coimbatore

- **Model new layout against proven successes:**
- **Design examples that contribute towards high productivity:**
  - **Separate entrances for paying and subsidized patients**
  - **Shared operating theaters**
  - **Separate OT for retina surgeries**
  - **Utilization of central investigation room**

DESIGN

Specialized units

- All services under 1 roof
- Decreased waiting time
- Group related services

What we did

- General Units - Ground floor
- Below 40 in Unit 3
- Pre-OP clinic
- Cataract Clinic for post-op care
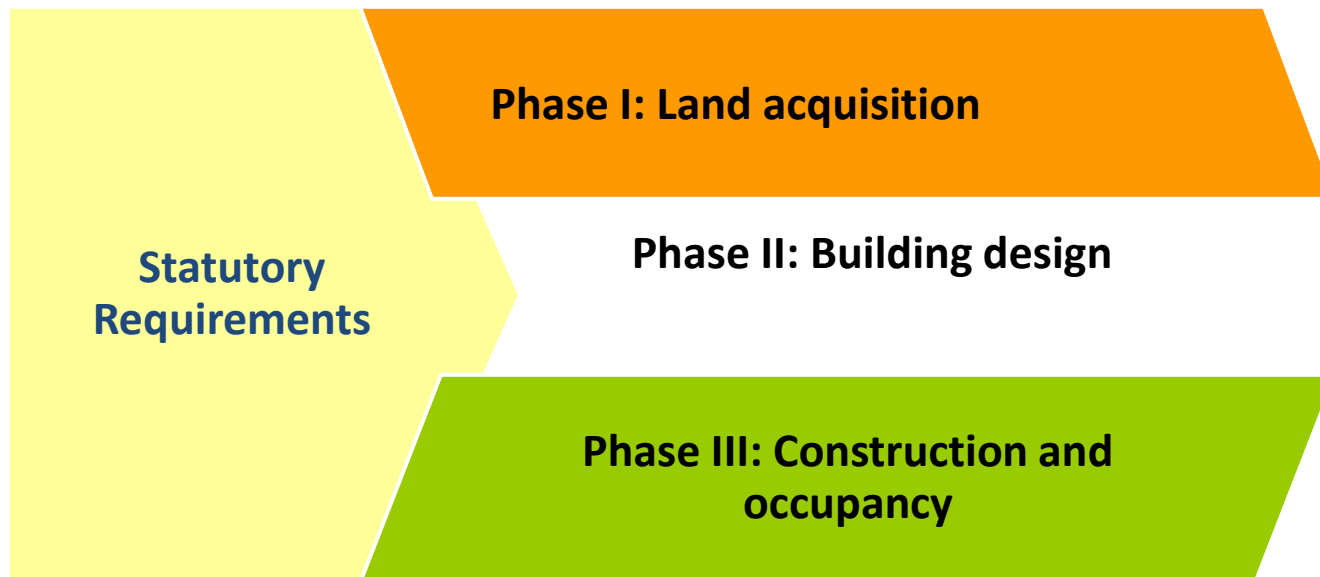
DESIGN

What we did

- Optical shops
- Medical shops
- Cash counters
- Counselling Units

Clinic Layout

- Separate flow
- Proximity to other clinics
- Minimize movement

Statutory Guidelines

- **West Bengal (Birla Eye Hosptial) serves as a stringent case example**

- **Three project phases each involve unique legal requirements:**

Statutory Requirements

Phase I: Land acquisition

Phase II: Building design

Phase III: Construction and occupancy

Physical Infrastructure: Key Takeaways

- Understanding the functional flow

- Allow for future innovation when planning hospital

- Use local knowledge to plan for legal requirements

- Leverage the organization's relationships with vendors to secure competitive prices on equipment

"*Intelligence & capabilities are not enough.*

There must be the joy of doing something beautiful.."

- Dr. V

Thank You!