Rethinking models of care

Do we still need hospitals?

Mike Nightingale
The very first requirement in a Hospital is that it should do the sick no harm.

Florence Nightingale,
Notes on Hospitals (1863)
What is a hospital?

Designing a healthcare system from scratch.

Conclusions
What is a hospital?
What is a hospital?

- **Key Principles**

- Originally a place of hospitality with the same word route as hostel from the Latin word Hospes

- Shelters for the needy and sick first systemised in 300 BC India

- Florence Nightingale pioneered the modern hospital. Design based on good nursing practices of cleanliness and observation

- Nightingale Wards 1870-1913. Many of these flexible buildings are still in active use even by top Teaching Hospitals such as Kings College Hospital
Designing a healthcare system from scratch
Huge costs of healthcare delivery
UK spends 9.5% of GDP on health
USA nearly 20%

Health education – dramatic reduction in healthcare usage by stopping smoking, drinking in moderation, exercising and eating healthily

70% of costs fall to treating children, women of child bearing age and long term care, including diabetes, COPD and cancer management
Appropriate design solutions for different local environments
An appropriate solution

Do we still need hospitals?

RIDERS FOR HEALTH
The right solution for the economy and society.
Do we still need hospitals?

Beijing, China
Morelos, Mexico
Nairobi, Kenya
New Delhi, India
Bangkok, Thailand
Jakarta, Indonesia
Manila, Philippines
Ho Chi Minh City, Vietnam
Moscow, Russia
Solar Lighting

Do we still need hospitals?

Spend money in the community to help education

Inexpensive and healthy alternative to kerosene lamps. This example from Barefoot Power.

History of the World in 100 Objects

#100: Solar Powered Lamp and Charger, China
Envirofit Cooking Stoves

Do we still need hospitals?

- **Spend money in the community on safety**
- More than three billion people, or half the world’s population, cook in their homes using traditional fire and stoves, burning biomass fuels like wood, dung and crop waste.
- Air pollution currently claims the lives of 1.5 million people a year worldwide, or one person every 20 seconds. Women and children make up 85% of these deaths due to their increased exposure in the home.
- Envirofit cookstoves reduce emissions by as much as 80%, use up to 60% less fuel and reduce cooking cycle time by up to 50%.
Building a 2020 Vision -- now 2030

Do we still need hospitals?

**Building a 2020 Vision: Future Healthcare Environments**

Study by the MARU for The Nuffield Trust, 2001

- Healthcare delivery via four distinct settings
- Care & treatment local to patient
- Homecare essential ingredient
- Developments in technology
- Subsequent increase in ambulatory care
- Reduction in number of acute beds
- Closer link between health & social care services – co-location
- Gradation between acute facility, community and home

| Home | Self care Monitoring  
|      | Automated treatment  
|      | Information & advice  
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| Integrated Health & Social Care Centres  
| Up to 10K close to home  
| GP surgeries  
| Drop-in centres  
| Healthy living centres  
| Community Care Centres  
| Up to 100K  
| Heart of the community  
| Resource centres  
| Community hospitals  
| Basic diagnostic services  
| Day interventions  
| Minor injuries  
| Nurse led inpatient care  
| Intensive rehabilitation  
| Chronic care management |
| Community hospitals |

| Specialist Care Centres  
| From 250-1000K  
| Central city sites  
| DTC’s  
| Secondary care  
| Tertiary care  
| Planned interventions  
| Emergency care  
| Complex diagnostic  
| Treatment & inpatient care |
| Tertiary care |

- Home
- Nursing home  
| Pharmacy  
| Cyber café  
| Health kiosk |

- Integrated Health & Social Care Centres  
  - GP surgeries  
  - Drop-in centres  
  - Healthy living centres

- Community Care Centres  
  - Up to 100K  
    - Heart of the community

- Specialist Care Centres  
  - From 250-1000K  
    - Central city sites

**Home Integrated Health & Social Care Centres**

Up to 10K close to home

**Community Care Centres**

Up to 100K  
Heart of the community

**Specialist Care Centres**

From 250-1000K  
Central city sites

**Self care**

- Monitoring
- Automated treatment
- Information & advice
- NHS Direct

**Social care**

- Primary care
- Outreach care
- Information & advice

**Basic diagnostic services**

- Day interventions
- Minor injuries
- Nurse led inpatient care
- Intensive rehabilitation
- Chronic care management

**Planned interventions**

- Emergency care
- Complex diagnostic
- Treatment & inpatient care

**Resource centres**

- Community hospitals

- Integrated Health & Social Care Centres
  - GP surgeries
  - Drop-in centres
  - Healthy living centres

- Community Care Centres
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- Specialist Care Centres
  - From 250-1000K
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Do we still need hospitals?

Working Example of a Decentralised Approach

Gwent Clinical Future

IBI Nightingale

Wales

Gwent

Primary care & resource centres

Local General Hospital

Specialist Critical Care Centre
Primary Care & Resource Centres

Hove Polyclinic
Nightingale Associates

Hove Polyclinic was the first purpose designed in UK, completed in 1997

Heart of Hounslow Polyclinic
Penoyre & Prasad

Do we still need hospitals?

Hove Polyclinic was the first purpose designed in UK, completed in 1997
Specialist Critical Care Centre

Gwent Specialist Critical Care Centre
Nightingale Associates

Do we still need hospitals?

Emergency, specialist OPD’s & diagnostics

Theatres, recovery & critical care

Inpatient & pathology
**Do we still need hospitals?**

- Patient focused care central to both ACaD and BECaD
- ACaD part of new wave of UK Government DTC’s
- Routine elective care separate from Acute and Emergency
- Dedicated scheduling, rapid diagnosis and interventionary procedures
- A hospital without beds
- BECaD aims to reengineer and rationalise Acute and Emergency care
- Differentiates respective admission streams
- Integrated and tailored clinical response
- Re-aligned treatment protocols and retraining of clinical teams
Rethinking Models of care from scratch

Do we still need hospitals?

Design issues

Healthcare facilities integrated into the urban and rural fabric rather than stand alone facilities

Loose fit long life design allowing for rapid changes in technology and expediential medical advances
The new construction of the Martini Hospital in Groningen is a national demonstration project for building in an Industrial, Flexible and Demountable way (IFD). As a result of uniform dimensions, the building is flexible at floors. The main structure has been separated from the core concept that is constantly changing in the course of years. If this will lead to other requirements in the design lay-out and functionality must meet, the building can be adjusted in a relatively simple way.

Completion
The new Martini Hospital, which is now under construction, will be completed in 2007. The old accommodation will be mainly used for auxiliary services. Besides, some parts will be leased.

Dismountable
The façade is so-called double-layer façade. The exterior of the double-layer façade is completely made of glass and has, amongst other things, a sound-absorbing function. The entire middle of the façade is made up of mobile, demountable façade elements. Thus the building can be easily adjusted to the rear part of the department.

Flexible
Thanks to the construction and the architecture, parts may be added to the building. Extension of 25 488 m² will be hung to the construction from the outside. This may increase the total floor space by 15%. The translations are our own to facilitate.

Future flexibility: healthcare as part of the urban fabric
Strategic Planning

New Martini Hospital, Groningen, Netherlands
Burger Grunstra

Nursing Department

Outpatients Department

Office Space

Do we still need hospitals?

- ‘IFD’ principle, Industrial, Flexible and Demountable
- Flexible layout responds to patient and clinical demands / changes
- Industrial building concept based on standardisation
- Standard room dimensions
- Extension between 2.4-7.2m as ‘drawer’ concept
- Can increase area by 10%
- Demountable internal and external building systems
Finsbury Health Centre London
Berthold Lubetkin 1938

Do we still need hospitals?

Provide appropriate work, education and healthcare together in an iconic building that ‘cried out for a new world’
Do we still need hospitals?

- Provide appropriate work, education and healthcare together
- Contemporary solution in the UK using the LIFT programme
HEALTH PROMOTING LIFE STYLE CENTER IN AFRICA

TRIPLE EMBRACE

NATIONAL DEPARTMENT OF HEALTH, SOUTH AFRICA

INTERNATIONAL ACADEMY FOR DESIGN AND HEALTH
Health Promoting Life Style Centers (HPLCs) should be **points of access and interaction** for local communities with stakeholders.

Our design concept is organized around **two courtyards linked by a route**:  

- **Outer courtyard** - **HAND**, *entrepreneurial space* for job-skills training and income-generation programmes,
- **Threshold** - **MIND**, *information and education area* to encourage behaviour change, early care-seeking and risk-reduction,
- **Inner courtyard** – **HEART**, *health assessment, screening and recreational facilities* in an environment that stimulates and comforts the senses.
The spatial sequence is enhanced by a sense of discovery that ranges from the public and familiar of the HAND courtyard, rising through the informative and educational of the MIND building, to the inspiring and nurturing of the HEART courtyard.
Local Identity

*Community participation,* in the definition of needs and during construction through self-build, confers an HPLC its local identity. The visibility and architectural presence through the application of indigenous materials and architectural motifs reinforces *community ownership.*
Soweto - Sports Court

In the urban area of Soweto health promotion may translate into creating opportunities for *fresh air exercise and encouraging healthy diet*. The focus of this HPLC could be on the **HEART** in the form of an open air sports court and healthcare facilities to address diabetes and obesity.
In the Khayelitsha township, stakeholders and users may highlight the need for the *creation of sustainable businesses*. The focus could be on entrepreneurship, allowing the HAND to cater for rentable start-up shop units trading the produce of the HEART’s community food garden.
Kwazulu Natal - Swimming Pool

In the rural Kwazulu Natal scenario consultation may reveal that health could be vastly improved by a more *informed approach to hygiene*. The focus of the rural HPLC could therefore be the promotion of personal cleanliness through education of the **MIND** building and the use of a pool in the **HEART**.

*Rural context configuration*
Desire Lines

*Transport is a key facilitator* in the development of the HPLC. It allows the three rural, urban and township centres to be physically connected and for the learning, that has taken place regionally, to be disseminated and form the basis of other centres across Africa.

The creation of the first HPLCs will generate, through a process of cultural cross-pollination and learning, *a network of routes* (desire lines) along which health, trade and culture may develop.
Rethinking Models of care from scratch

**Science factors**

**Technology and IT advances allowing facilities to evolve in tandem with medical and social change**

- Telehealth – smartphone apps for self monitoring to dialing 111
- Telemedicine – battle theatre operations using robotic surgery performed remotely
- Human genome mapping leading to personalised diagnosis and treatment
SurgiCube Operation Unit

Do we still need hospitals?
Re-Use

The BedPod
Nightingale Associates

Do we still need hospitals?
Re-Use

The BedPod
Nightingale Associates

Do we still need hospitals?
Cancer treatment takes a giant step forward as scientists crack code

Mark Henderson, Science Editor

The complete genetic codes of two human cancers have been mapped for the first time. The move could herald a medical revolution in which every tumour can be targeted with personalised therapy.

The exhaustive genetic maps, which catalogue every DNA mutation found in two patients' tumours, will transform treatment of the disease.
Mapping lung cancer

In a decade or so, a chart such as this one for a lung cancer patient will be compiled for every cancer patient, but it is hoped to establish which treatments are most likely to work.

- **Outer layer:** The patient’s 24 chromosomes
- **Green dots:** Small “hot spots” — places where short segments of DNA are inserted (light green) or deleted (dark green)
- **Pale orange bars:** Single-point mutations, where one DNA letter has changed in spelling
- **Dark orange bars:** Double point mutations, where two DNA letters have changed in spelling
- **Blue lines:** Copy number changes. There are normally two copies of each part of the genome, but in cancer some sections can become duplicated one or more times, or deleted entirely
- **Green lines:** Rearrangements within chromosomes, where segments of DNA have become mixed up
- **Purple lines:** Rearrangements between chromosomes. Chromosome 1, for example, has swapped some material with chromosome 4 and 11

**The chart for a melanoma**

- **15**
  - Number of cigarettes smoked for each genetic mutation
- **33,345**
  - Number of mutations in a 43-year-old man’s melanoma genome
Conclusions
People will continue to die, albiet from more and more complex conditions as our ability to cure further evolves. Major Trauma Centres and specialist hospitals will remain relevant.

The non specialist stand alone District General Hospital is probably more dangerous than staying at home and a hugely expensive form of treatment.

The future will be integrated networks of care emphasising home and community treatment with hospitalisation a last resort as advocated by the Future Hospital Commission.

Public perception – better to innovate functionality than shut hospitals?