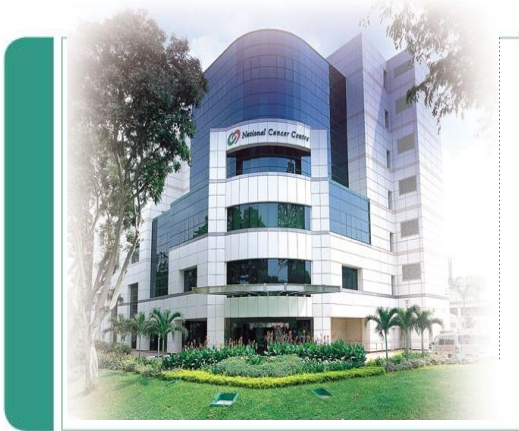


Emerging issues in Oncology: The Singapore Perspective



Ravindran Kaneshvaran, MD

President , Singapore
Society of Oncology

December 2015

• service
• education
• research



PATIENTS. AT THE HEART OF ALL WE DO.

Members of the SingHealth Group



Land Area: 704 km² Population: 5,399,000 (2013)



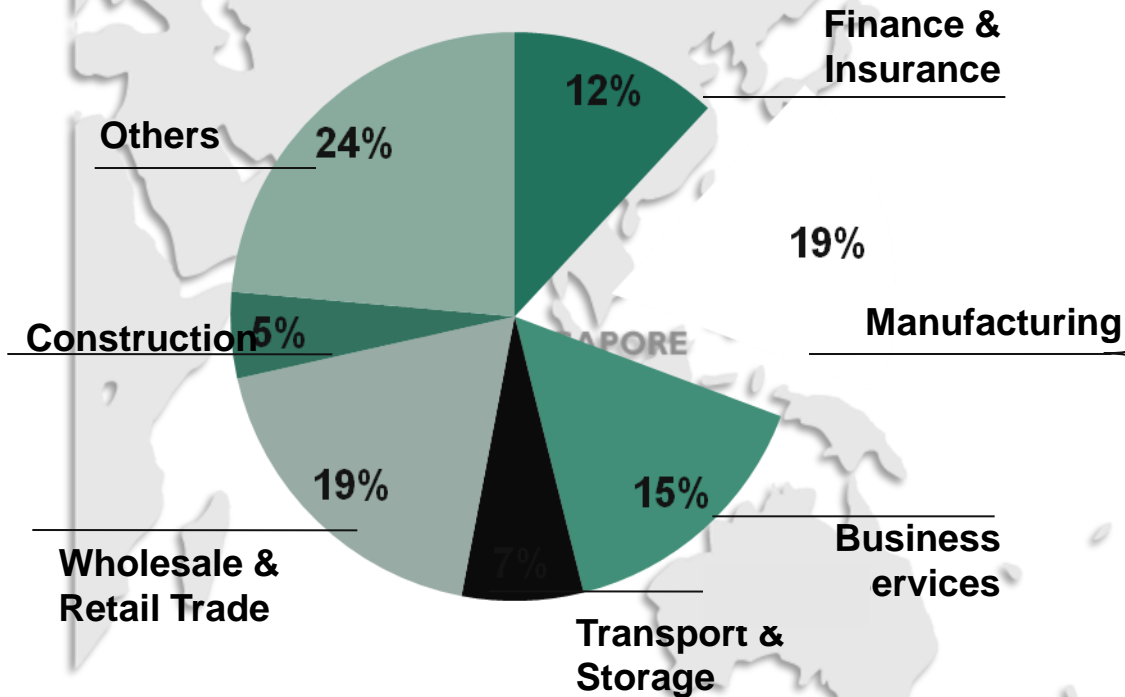
> 60% of subsidized cancer care seen by NCCS

Patients. At the Heart of All We Do.



Singapore's Economy

2013 GDP: S\$372.8 bil
(US\$297.9 bil)



Value Added



— 30%
Electronics



— 21%
Biomedical Sciences



— 17%
Transport Engineering



— 13%
Precision Engineering



— 12%
General
— 7%
Chemicals

2013 GDP growth: 3.9%
2014 Forecast GDP growth: 2.5% to 3.5%

Source: PM's National Day Message

Cancer trends in Singapore

Table 4: Ten Most Frequent Cancers in Singapore Males, 2006-2010

Rank	Site	No.	%	CR (95% CI)*	ASR (95% CI)**
1	Colo-rectum	4,456	17.8	49.3 (47.9-50.8)	39.9 (38.7-41.1)
2	Lung	4,062	16.2	45.0 (43.6-46.4)	37.3 (36.1-38.4)
3	Prostate	2,860	11.4	31.7 (30.5-32.8)	27.1 (26.1-28.1)
4	Liver	1,897	7.6	21.0 (20.1-21.9)	17.0 (16.2-17.8)
5	Lymphoid neoplasms	1,579	6.3	17.5 (16.6-18.3)	15.6 (14.8-16.4)
6	Stomach	1,404	5.6	15.5 (14.7-16.4)	12.8 (12.1-13.5)
7	Skin, including melanoma	1,247	5.0	13.8 (13.0-14.6)	11.2 (10.5-11.8)
8	Nasopharynx	1,158	4.6	12.8 (12.1-13.6)	9.5 (8.9-10.0)
9	Kidney & Oth. Urinary	821	3.3	9.1 (8.5-9.7)	7.2 (6.7-7.7)
10	Bladder	759	3.0	8.4 (7.8-9.0)	6.8 (6.3-7.3)
	Others	4,844	19.3		
	All Sites	25,087	100.0	277.8 (274.3-281.2)	229.6 (226.7-232.5)

*CR Crude rate per 100,000 per year

** ASR Age-standardised rate per 100,000 per year. ASR derived by the direct method using the "World Population".

Figure 1: Ten Most Frequent Cancers (%) in Singapore Males, 2006 -2010

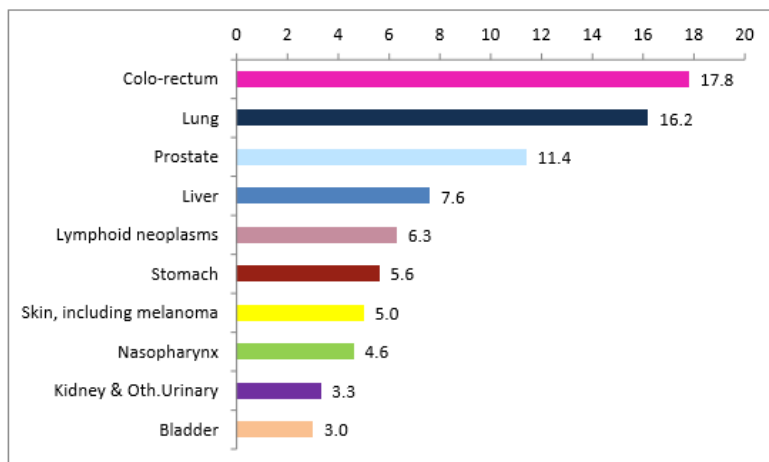


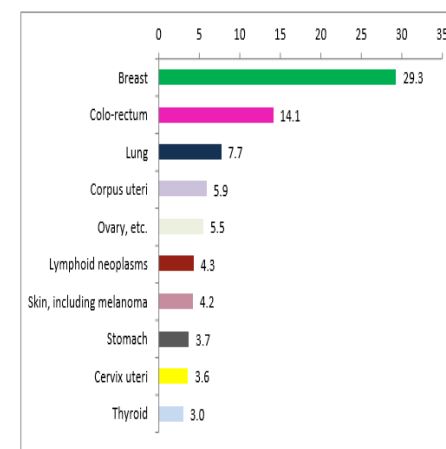
Table 5: Ten Most Frequent Cancers in Singapore Females, 2006-2010

Rank	Site	No.	%	CR (95% CI)*	ASR (95% CI)**
1	Breast	7,781	29.3	84.4 (82.5-86.2)	60.7 (59.3-62.0)
2	Colo-rectum	3,750	14.1	40.7 (39.4-42.0)	28.2 (27.2-29.1)
3	Lung	2,057	7.7	22.3 (21.3-23.3)	15.3 (14.6-16.0)
4	Corpus uteri	1,574	5.9	17.1 (16.2-17.9)	12.4 (11.8-13.0)
5	Ovary, etc.	1,455	5.5	15.8 (15.0-16.6)	12.0 (11.4-12.7)
6	Lymphoid neoplasms	1,136	4.3	12.3 (11.6-13.0)	10.3 (9.7-11.0)
7	Skin, including melanoma	1,113	4.2	12.1 (11.4-12.8)	8.0 (7.5-8.5)
8	Stomach	993	3.7	10.8 (10.1-11.4)	7.2 (6.8-7.7)
9	Cervix uteri	960	3.6	10.4 (9.7-11.1)	7.5 (7.0-8.0)
10	Thyroid	808	3.0	8.8 (8.2-9.4)	6.8 (6.3-7.2)
	Others	4,943	18.6		
	All Sites	26,570	100.0	288.0 (284.6-291.5)	208.0 (205.4-210.6)

*CR Crude rate per 100,000 per year

** ASR Age-standardised rate per 100,000 per year. ASR derived by the direct method using the "World Population".

Figure 2: Ten Most Frequent Cancers in Singapore Females (%), 2006 - 2010



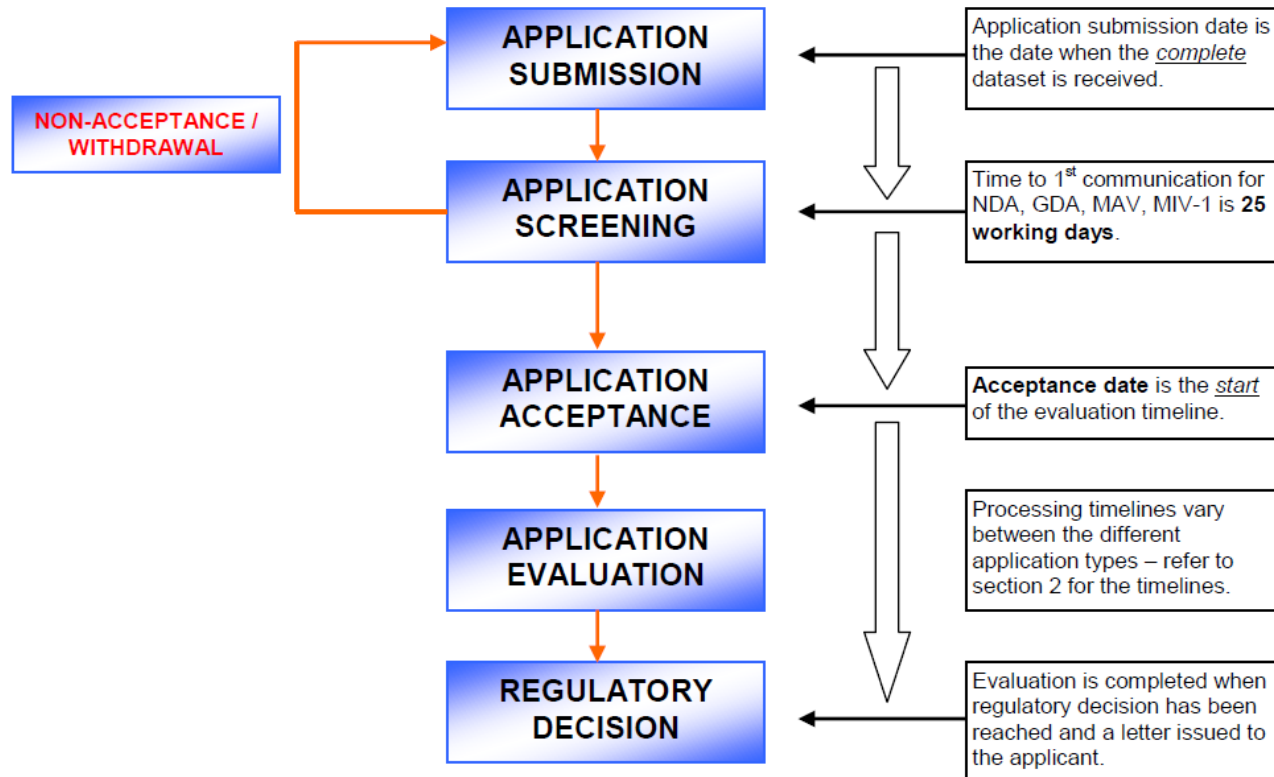
Challenges in Cancer Care in Singapore

- 1) Access to latest therapies / drugs
- 2) Cost of drugs
- 3) Cultural perception about chemotherapy / Cancer treatment
- 4) Research and Development

Challenges in Cancer Care in Singapore

- 1) Access to latest therapies / drugs
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New Drug Approvals (Health Sciences Authority Singapore)



Lag between FDA approval and HSA Approval

Challenges in Cancer Care in Singapore

- 1) Access to latest therapies / drugs
- 2) Cost of drugs/ healthcare financing
- 3) Cultural perception about chemotherapy / Cancer treatment
- 4) Research and Development

What is MediShield Life?

- Basic Health Insurance
- Replaced MediShield on 1 Nov 2015
- Covers All Singapore Citizens & Permanent Residents, For Life
- Offers Better Protection

1. Covers All Singaporeans

- ✓ Very old
- ✓ Currently sick
- ✓ Previously excluded

2. Covers For LIFE



3. Better Protection

**MediShield Life Pays More...
...Patients Pay Less**

www.moh.gov.sg


5

Example 2: Cancer

Underwent 4 Chemotherapy Cycles



Mdm Lim
63 years old



	MediShield (Before)	MediShield Life
Bill After Subsidy	\$6,800	
Insurance Pays	\$4,960	↑ \$6,120
Patient Pays (Medisave / Cash)	\$1,840	↓ \$680

MediShield Life Pays More, Patient Pays Less

Challenges in Cancer Care in Singapore

- 1) Access to latest therapies / drugs
- 2) Cost of drugs
- 3) Cultural perception about chemotherapy / Cancer treatment
- 4) Research and Development

Cultural / Societal/ Internet Issues



ISIS Institute of Science in Society
Science · Society · Sustainability

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Miracle Chinese Cancer Cure

One of the latest 'miracle' cancer cures hails from China, and it is Kanglaite, a preparation made from a traditional staple food. It highlights the nature of Chinese remedies and the Chinese approach to health. [Dr. Mae-Wan Ho](#) reports.

[Sources and references](#) for this article are posted on ISIS Members' website. [Details here.](#)


Pharmacologist Li Dapeng began extracting the anticancer compounds out of the seeds of Job's tears (*Coix lachryma-jobi*) (Box 1) and experimenting with the compounds since 1975. Twenty years later, he won his government's approval to market an extract he calls Kanglaite, to help fight cancer and to reduce the side effects of conventional treatments. Li Dapeng has set up his own company in Hanzhou, the Zhejiang Kanglaite Pharmaceutical Company Ltd, in order to market the drug.

Original Article

Meta-analysis of cultural differences in Western and Asian patient-perceived barriers to managing cancer pain

Chen Hsiu Chen *Chang Gung University, Graduate School of Nursing, R.O.C; Kang-Ning Junior College of Medical Care and Management, R.O.C*
Siew Tzuh Tang *Chang Gung University, Graduate School of Nursing, R.O.C*
Chien Hao Chen *ESTAT Statistical Consulting Center, R.O.C*

 **PALLIATIVE
MEDICINE**

Palliative Medicine
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DOI: 10.1177/0269216311402711
pmj.sagepub.com




Challenges in Cancer Care in Singapore

- 1) Access to latest therapies / drugs
- 2) Cost of drugs
- 3) Cultural perception about chemotherapy / Cancer treatment
- 4) Research and Development

Singapore's R&D Framework

Research, Innovation
& Enterprise Council



Lee Hsien Loong
Chairman, RIEC
Prime Minister Singapore

Ministry of
Education



Ministry of
Health



Ministry of
Trade & Industry



NATIONAL
RESEARCH
FOUNDATION



Agency for
Science, Technology
and Research



SPRING
singapore

Polytechnics &
Universities

Hospitals

A*STAR
Research
Institutes

Corporate Labs

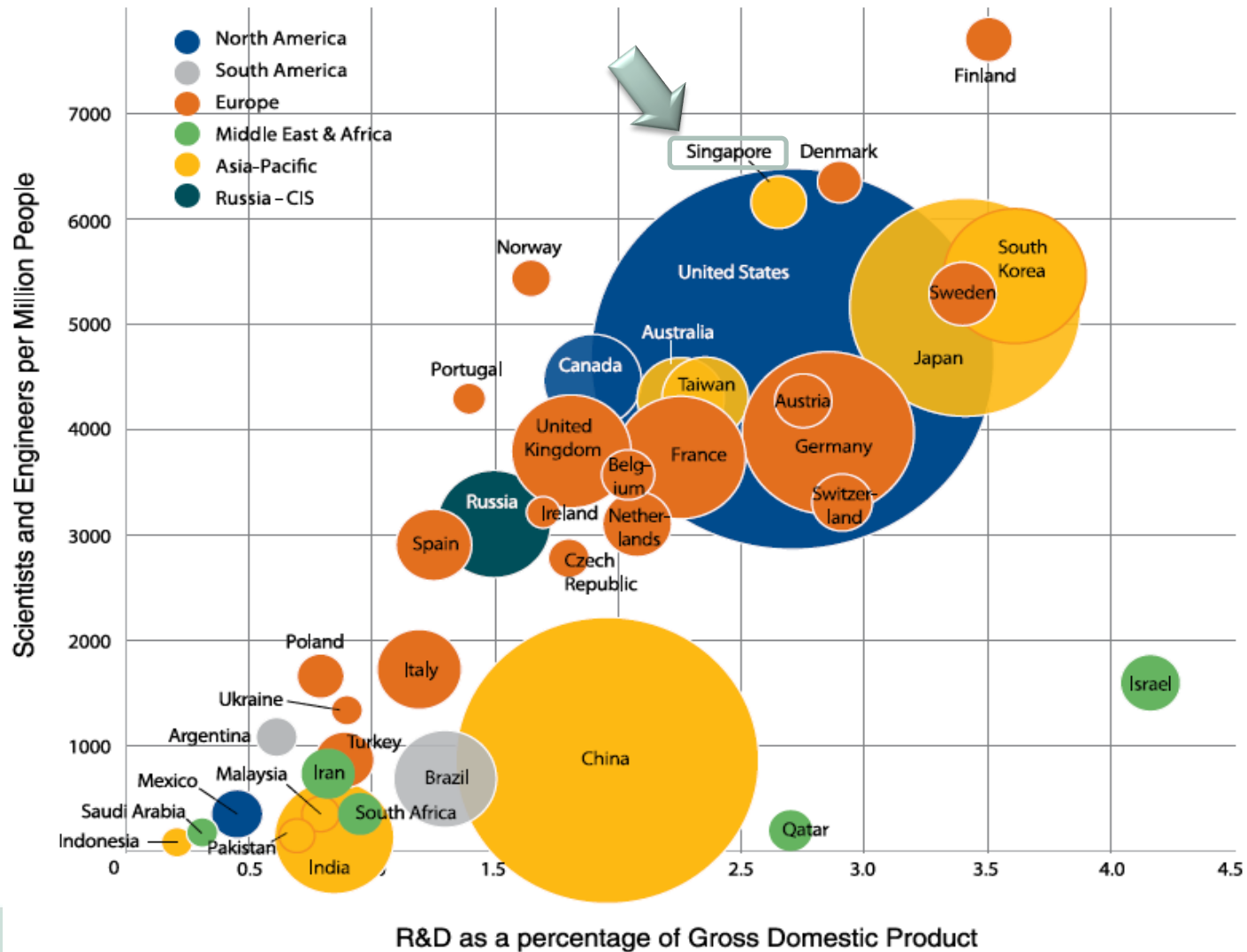
FUNDING AGENCIES &
MINISTRIES

RESEARCH
PERFORMERS



World of R&D 2013

Size of circle reflects the relative amount of annual R&D spending by the indicated country



Source: Battelle, R&D Magazine, International Monetary Fund, World Bank, CIA Fact Book, OECD

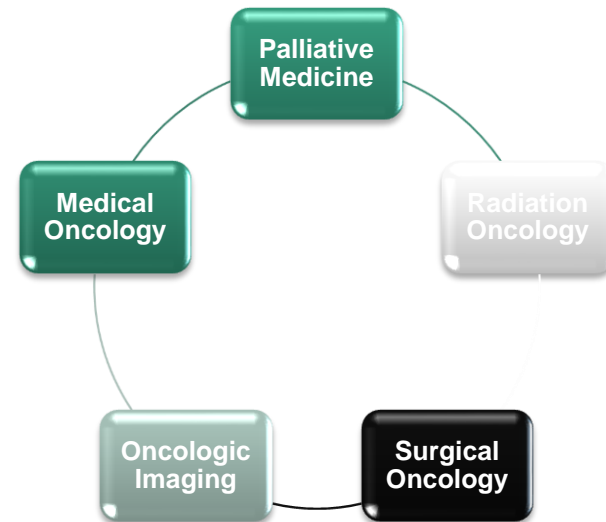
Patterns of patient referrals at NCCS



70% of public sector cancer patients
55% of all cancer cases in Singapore

Referrals and specialist services via Singapore General Hospital
Largest tertiary healthcare institution in Singapore (1500 beds)

Ophthalmology, Cardiology, Respiratory Medicine, Surgery
Interventional Radiology, Investigational Medicine Unit



Organization of trial-related activities



Other research Institutes
in Singapore e.g. A*Star, CSI

NCCS

Clinical Trials and
Epidemiological
Sciences (CTE)

Oncology Phase I
Program
(ECRU)

Tumour
xenograft
program

Clin
Pharm
Lab

CTRL

Bio-
imaging
group

SINGHEALTH

INVESTIGATIONAL MEDICINE
UNIT (IMU)
Phase I inpatient unit

PK/PD Core Laboratory

Centralized Institutional Review
Board

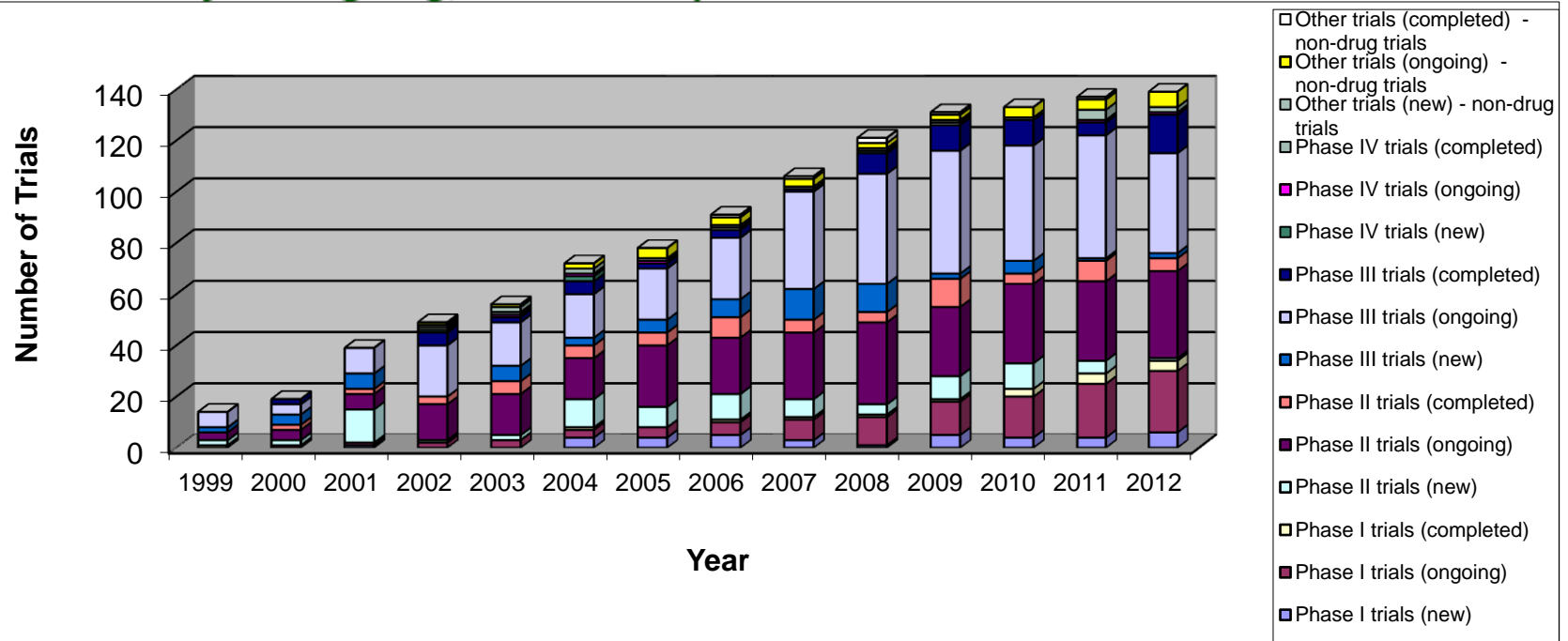
Singhealth Tissue Repository

Singhealth Experimental
Medicine Centre
Animal based research facility

Singhealth Legal

Ongoing and New Clinical Trials

Clinical Trials Summary: Summary of Ongoing, New & Completed Clinical Trials



- Annual increase in the number of trials since 1999
- A shift with increase number of early phase trials compared to phase 3 trials
- Medical Oncology runs the largest number of clinical trials than any other department in Singapore

Drug development expertise

Critical Appraisal

- ✓ Adequacy of existing data
 - Gaps to be addressed by scientific partners
- ✓ Position in Asia-Pacific landscape
 - Phase I workgroup: trialists, tumour-specific KOLs
- ✓ Due diligence

Regulatory matters

Pre-submission consultations
IRB submission
HSA: 3-4 weeks
IRB: 4 weeks

Idea

Protocol
Conception

Pharma
negotiation

Budget
Estimates

Grant
Submission

HSA &
IRB

FPF
V

Design & protocol development

- Hypothesis-testing clinical trials
- Parallel preclinical biomarker development
- Leveraging on strength of Singapore's Research Institutes e.g. ETC (A*Star), Duke-NUS

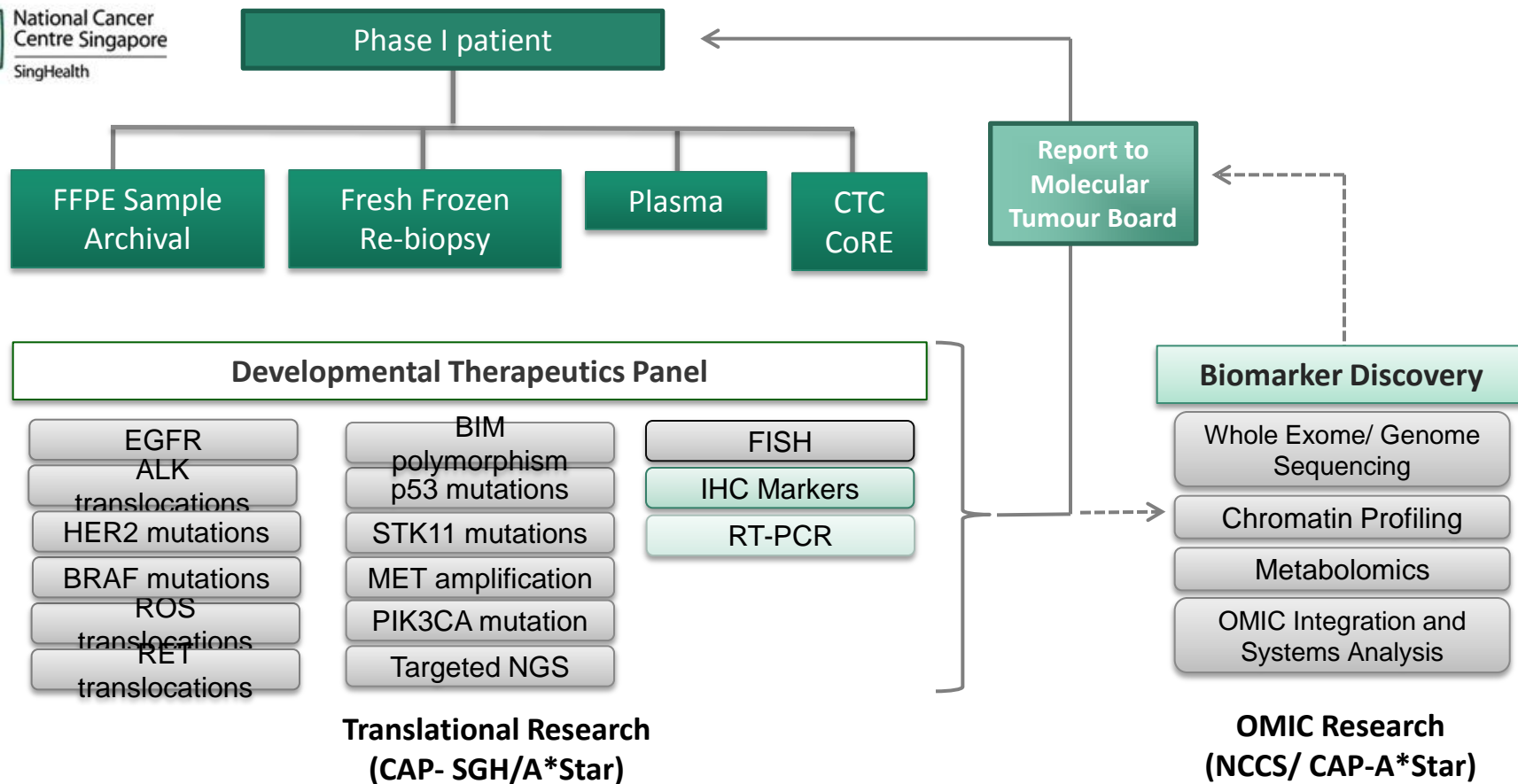
Academic grants

NMRC, co-development grants,
industry alignment funds

High quality data

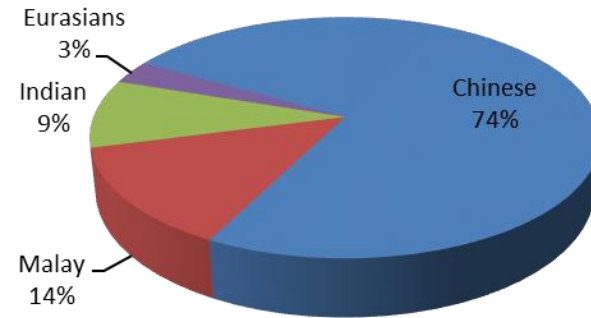
Efficient accrual
Robust biomarker studies
Dedicated phase I clinic
Regular audits

POLARIS & Translational Pathology Centre



Translational Clinical Research (TCR) Flagship Programmes

- Focus on Asian diseases and Asian phenotype
- Collaboration with international research institutions and industry
- Each up to \$25M over 5 years



Singapore Population:
5.3 million

ONCOLOGY



Singapore Gastric Cancer Consortium

Non-Small Cell Lung Cancer

National Lymphoma Translational Research Programme

METABOLIC DISEASE



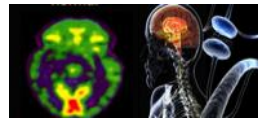
Developmental Pathways to Metabolic Diseases

EYE DISEASE



Eye Surgery and Innovative Technologies

NEUROSCIENCE



Vulnerability, Disease Progression & Treatment in Schizophrenia & Related Psychoses

Translational Clinical Research Programme in Parkinson's Disease

INFECTIOUS DISEASE



New Treatment Strategies against Dengue (STOP Dengue)

Singapore Programme of Research to Investigate New approaches for Tuberculosis

CARDIOLOGY



Genetic Predisposition, Epigenetic Change, MicroRNA Profiling & Experimental Therapies in Heart Failure


Patients. At the Heart of All We Do.

ICGC Cancer Genome Projects

Committed projects to date: [67](#)

Sort by: Project

Biliary tract cancer

Singapore 

Bladder Cancer

United States 

Bladder cancer

China 

Blood Cancer

United States 

Blood cancer

China 

Blood cancer

South Korea 

ICGC Goal: To obtain a **comprehensive** description of **genomic, transcriptomic and epigenomic changes** in **50 different tumor types and/or subtypes** which are of clinical and societal importance across the globe.

[Read more »](#)

[Launch Data Portal »](#)

[Apply for Access to Controlled Data »](#)

Jointly funded by NCCS, GIS and Duke-NUS

Summary

Singapore has extensive network to reach out to the rest of Asia

A circular image of the Singapore flag, featuring a red field with five white stars and a white field with a red border.

Business Environment

- Excellent infrastructure
- Strong distribution network
- Strong talent pipeline
- Strong government support

Science

- Integrated research network (Preclinical-translational-clinical)
- Asian phenotypes
- Asian-prevalent diseases
- Asian/Internationally acclaimed KOLs

Healthcare infrastructure

- Academic medical centres
- Investigational medicine units
- Multi-ethnic patient base
- Longitudinal patient health records