

Singapore Healthcare - The Last 20 years

Written in 2040

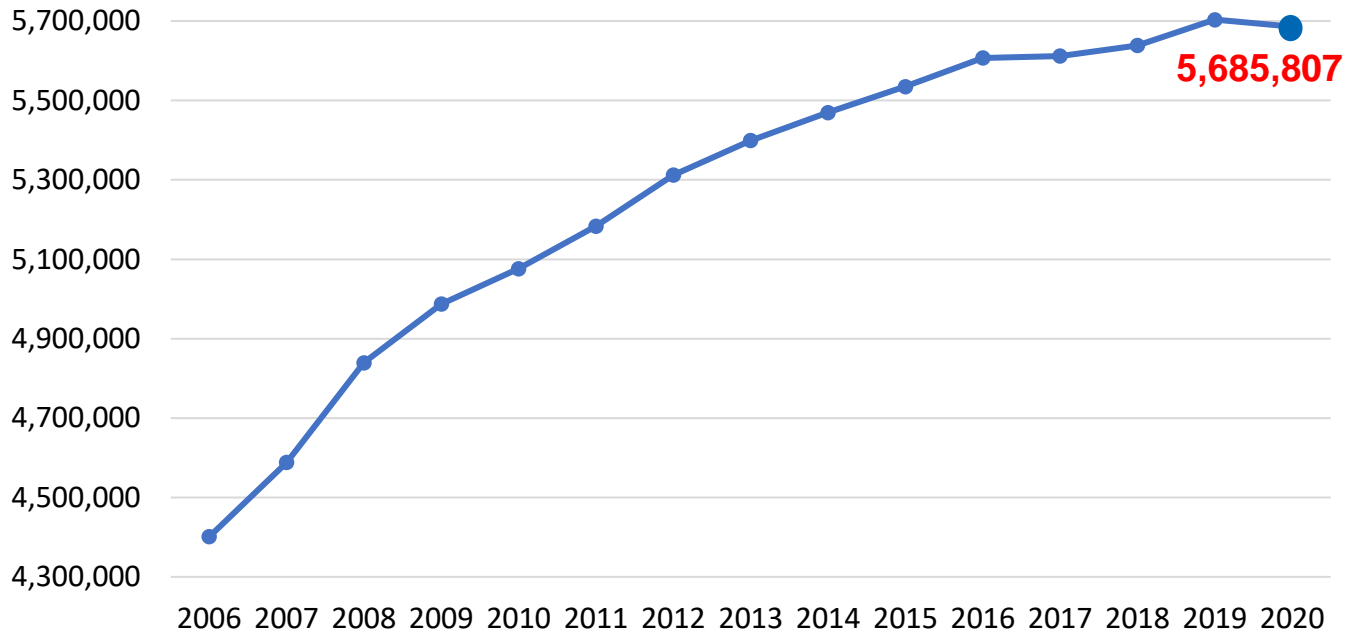
Dr Camilla Wong, Chief Pharmacist, MOH

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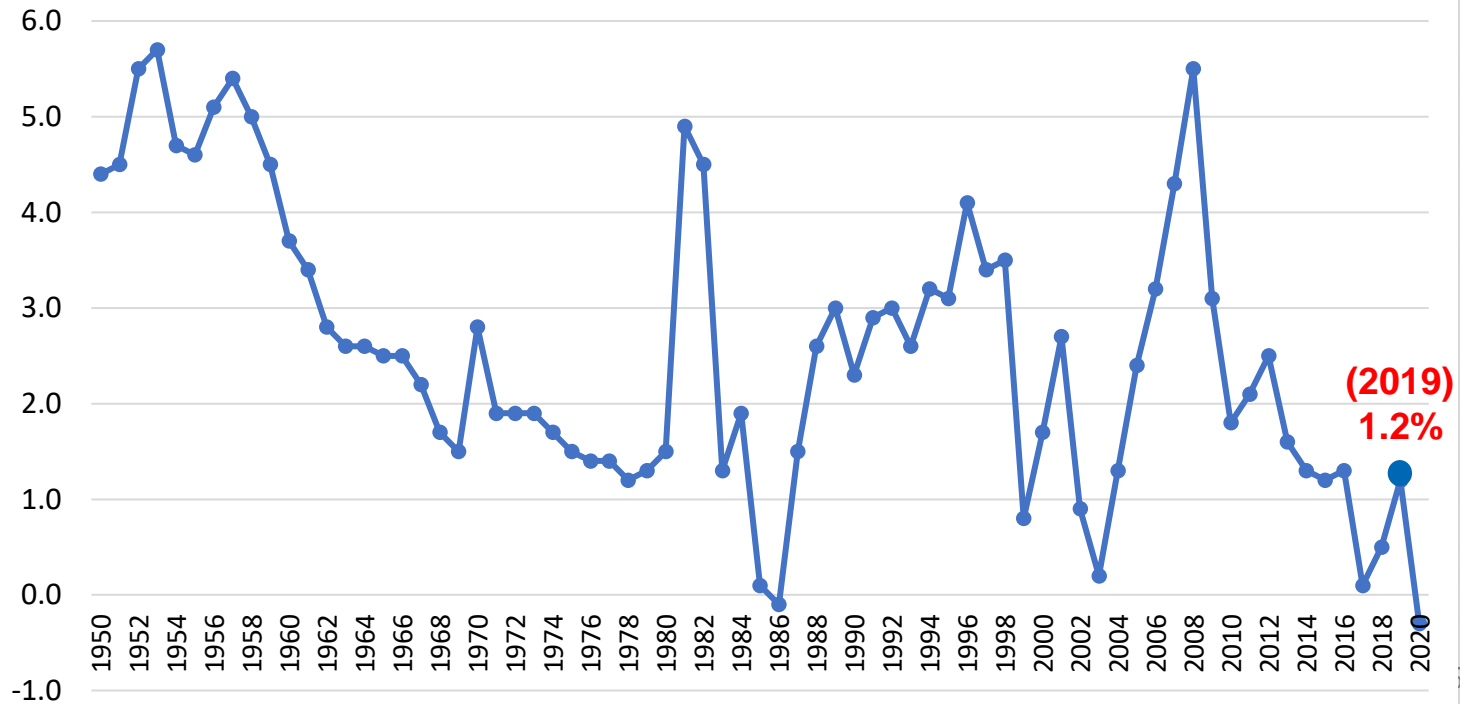
1. Chapter 1 – The Demand for Healthcare
2. Chapter 2 – How Healthcare Has Evolved
3. Chapter 3 - Generation Alpha
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Chapter 1 – The Demand for Healthcare

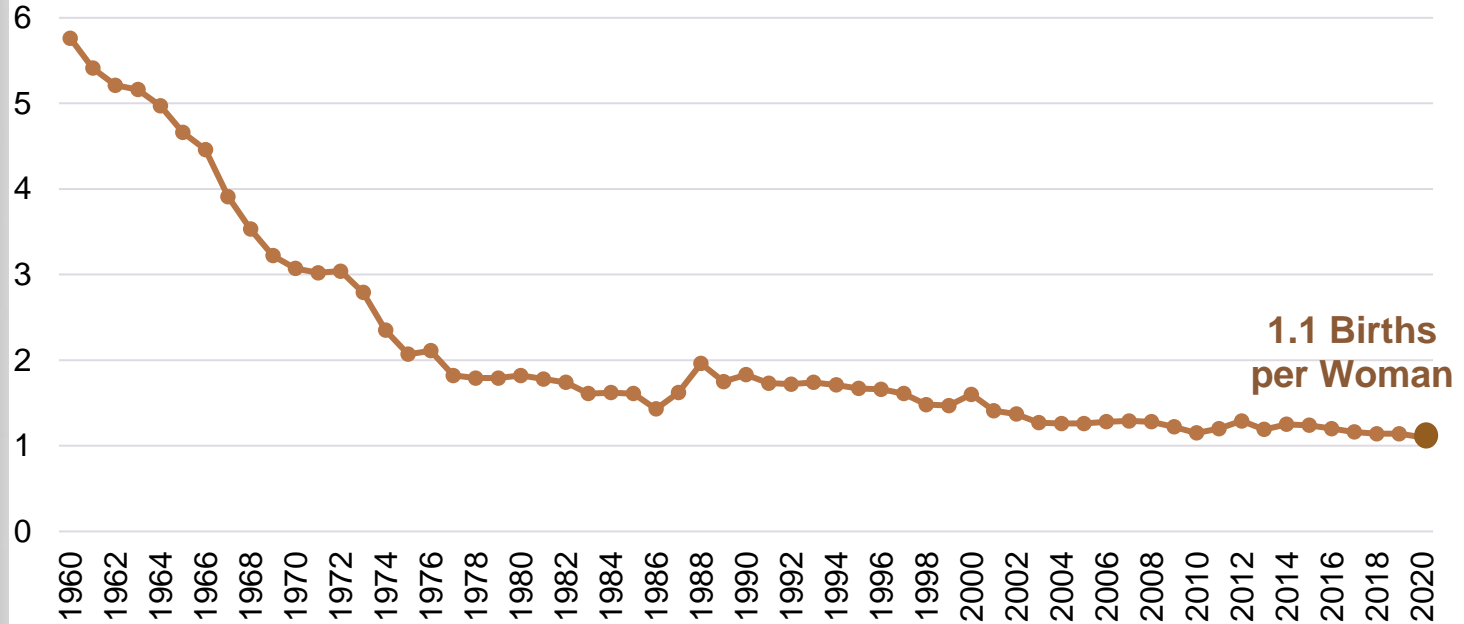
Population Growth



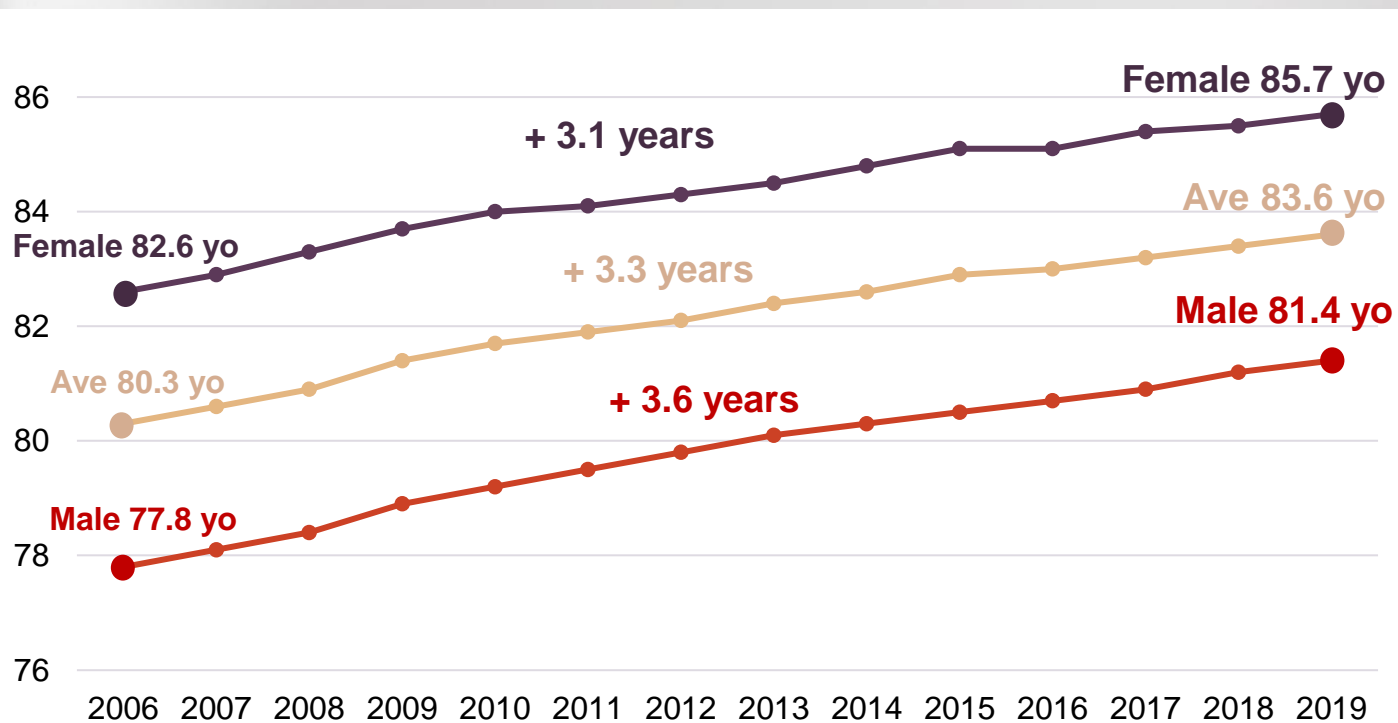
Population Growth Rate %



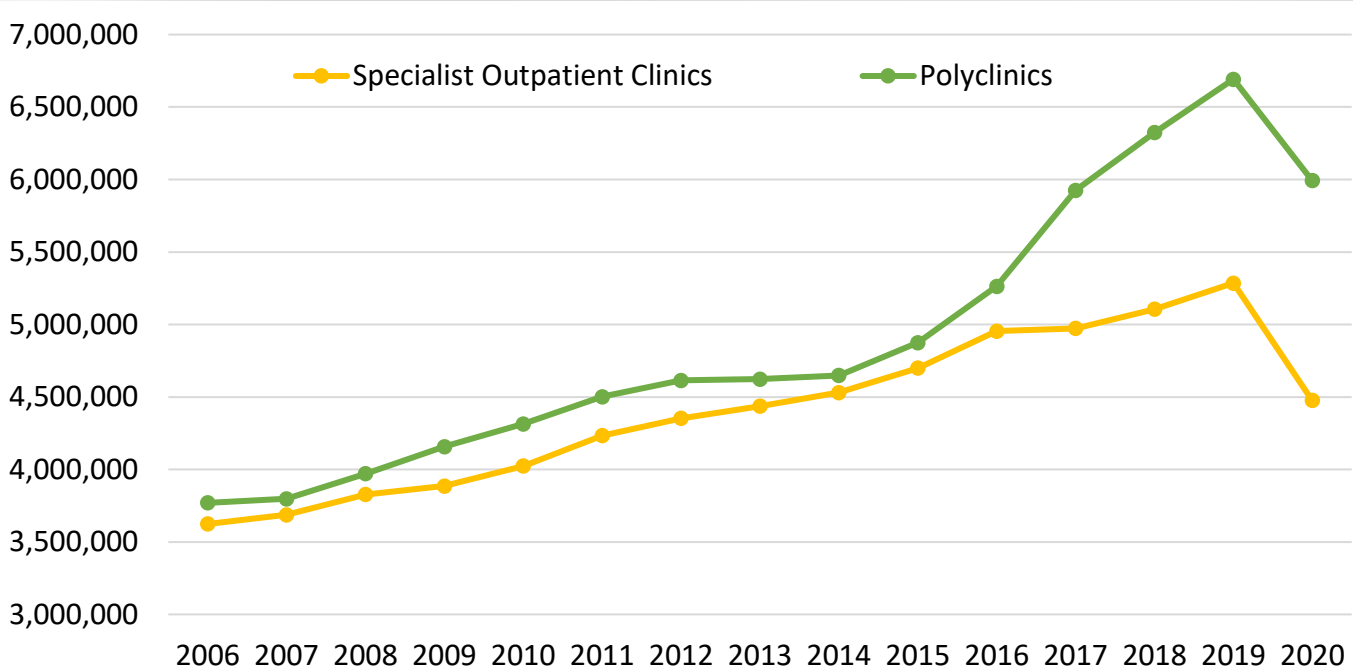
Total Fertility Rate



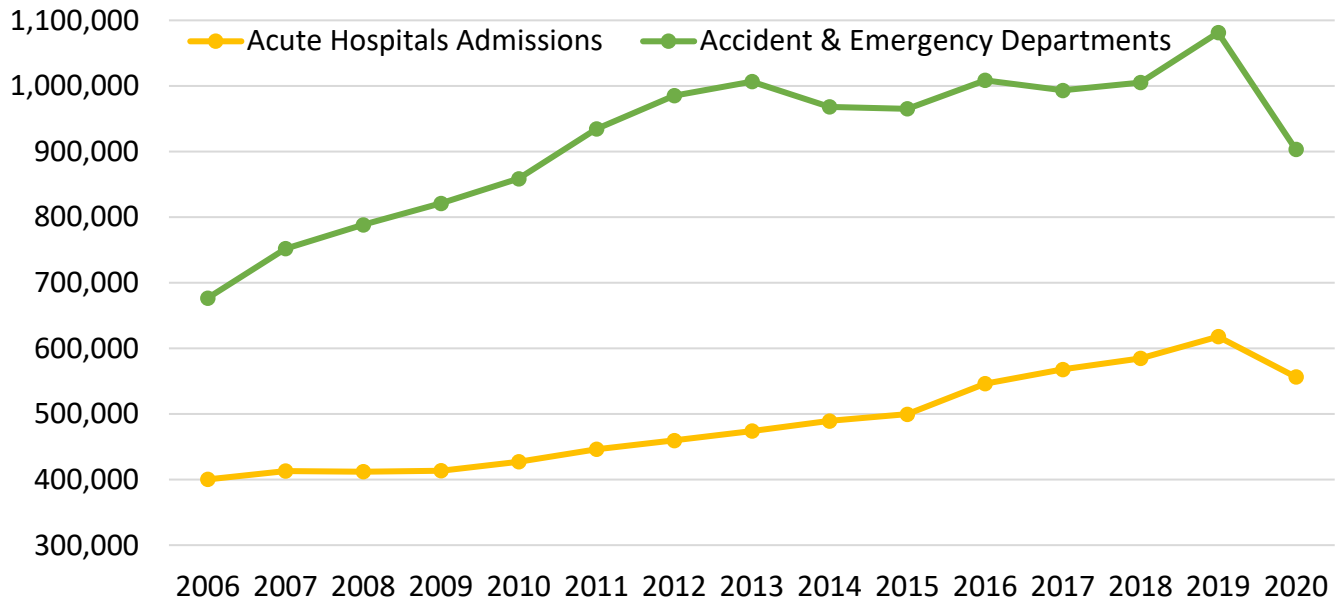
Life Expectancy



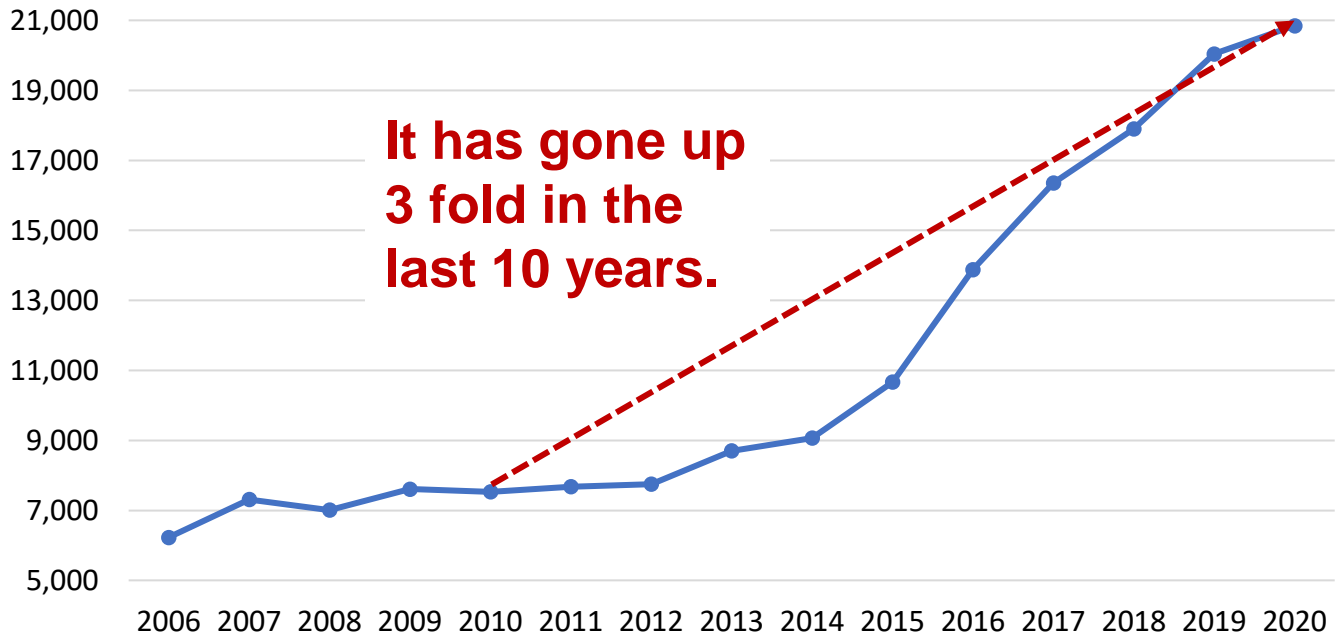
Polyclinic/SOC Attendances



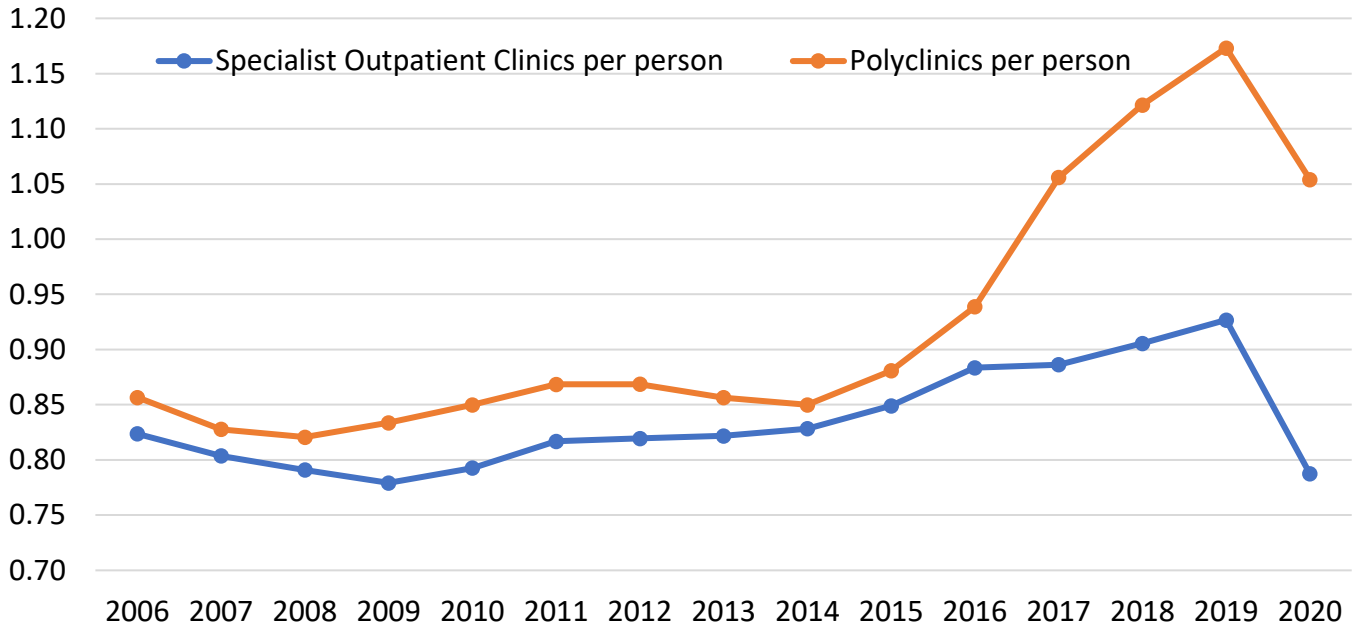
A&E and Acute Hospital Attendances



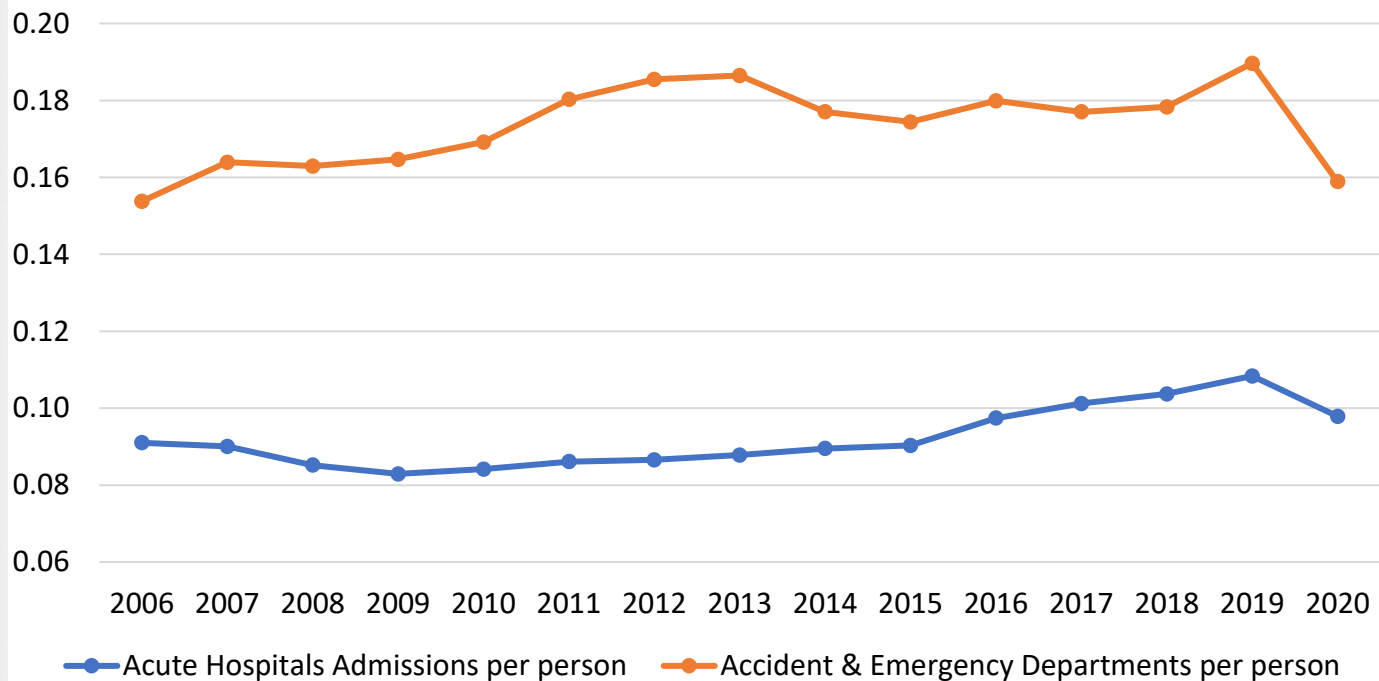
Community Hospital Admissions



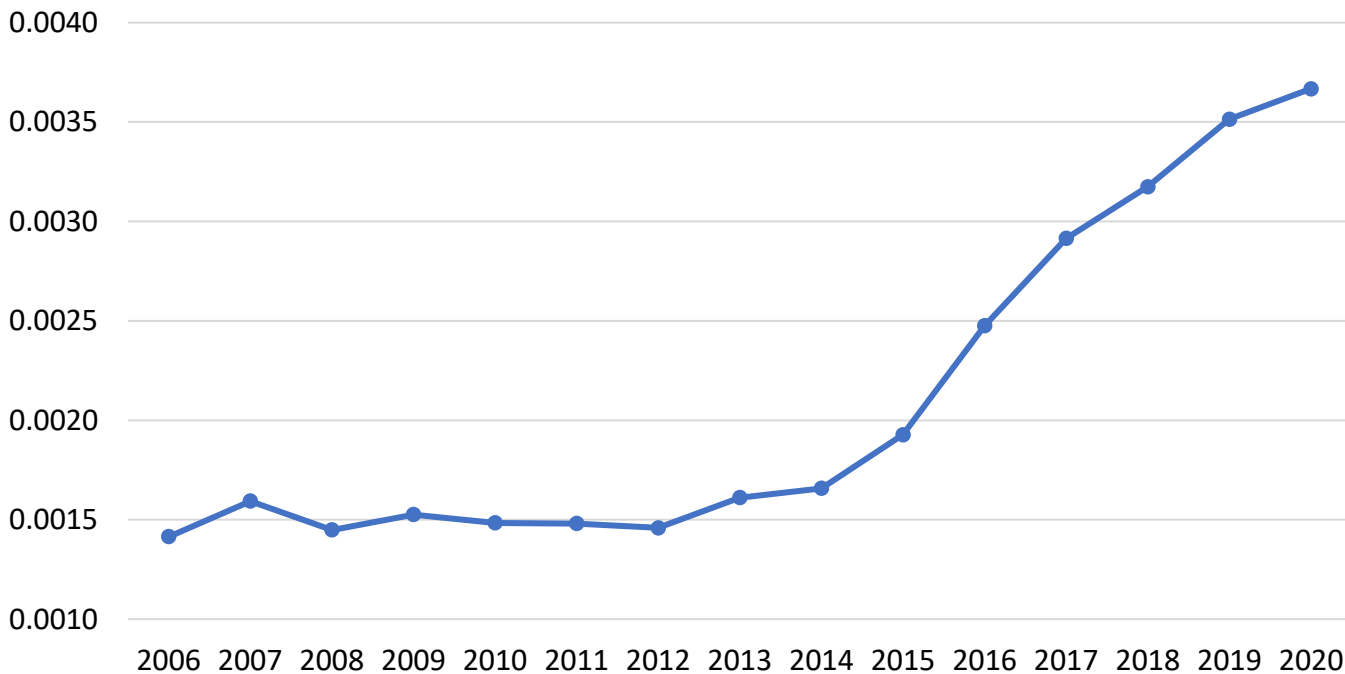
Polyclinic & SOC Attendances per person



A&E and Acute Hospital Attendances per person



Community Hospital Admissions per person



New Acute Hospitals & Specialty Centres built in the last 20 years

8



Woodlands Health Campus



TTSH Integrated Care Hub



**Alexandra Hospital
Redevelopment**



New National Skin Centre



**New National
Cancer Centre**



**SGH Elective Care Centre &
New National Dental Centre
Singapore**



**SGH Emergency Medicine
Building**



**New Integrated Acute and
Community Hospital at
Bedok North**

New Polyclinics and Primary Care Facilities built in the last 20 years

14



Bukit Panjang Polyclinic & Senja Nursing Home



Kallang Polyclinic & Long Term Care



Eunos Polyclinic



Sembawang Polyclinic



Khatib Polyclinic



Tampines North Polyclinic

Yew Tee Polyclinic

Pasir Ris Polyclinic

Tengah Polyclinic

Bishan Polyclinic

Redeveloped Jurong Polyclinic & Nursing Home

Bidadari Polyclinic & Nursing Home

Kaki Bukit Polyclinic & Nursing Home

Serangoon Polyclinic

15

New Nursing Homes built in the last 20 years

11



**Nursing Home at
Jurong West St 52**



**Nursing Home at
Tampines St 62**



**Nursing Home at
Tampines Ave 2**



**Nursing Home at
Potong Pasir Ave 1**



**Nursing Home at
Pasir Ris Drive 3**



**Nursing Home
at Punggol
East/Tebing Lane**



**Nursing Home at Former
Henderson Secondary
School**



**Nursing Home at West
Coast Link**



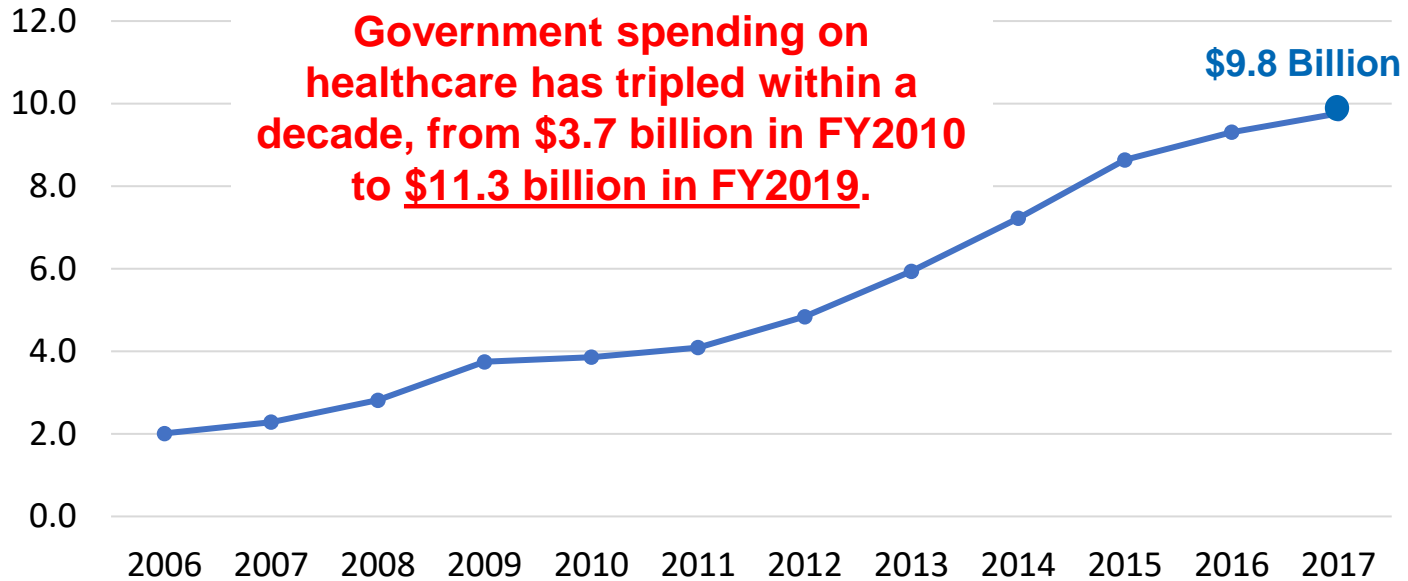
**Nursing Home at
Macpherson Road**

**Nursing Home at
Chin Cheng Ave**

**Nursing Home at
Aljunied Road**

Government Health Expenditure

\$ Billions



Our Healthcare Challenges



Increasing
Healthcare Costs

**“Money not
enough”**



Manpower
Constraints

**“Workers not
enough”**

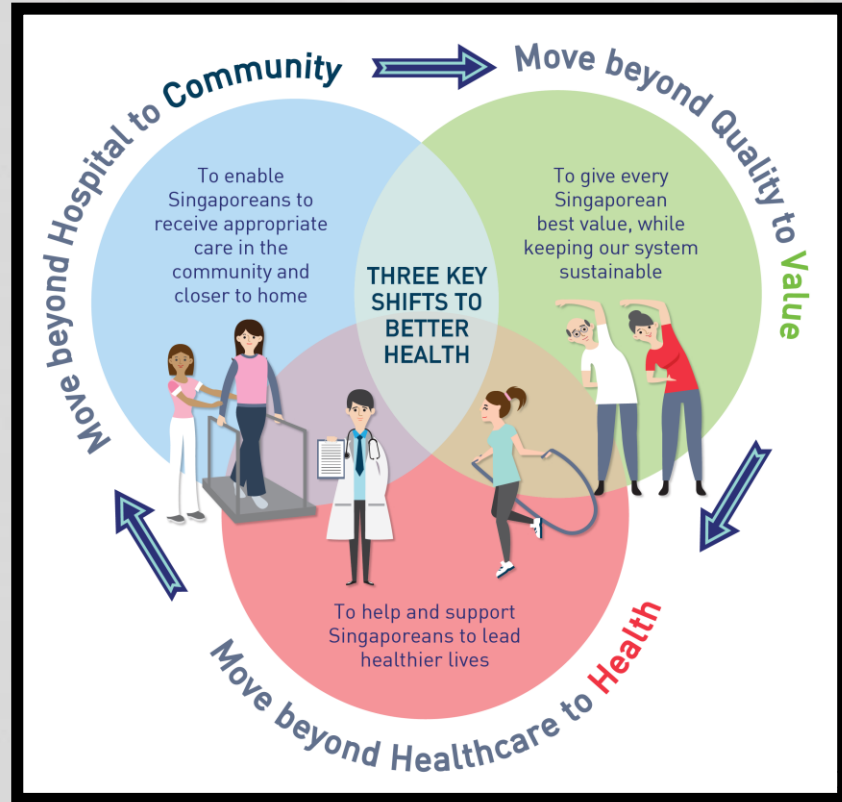


Weakening of
Family as Caregivers

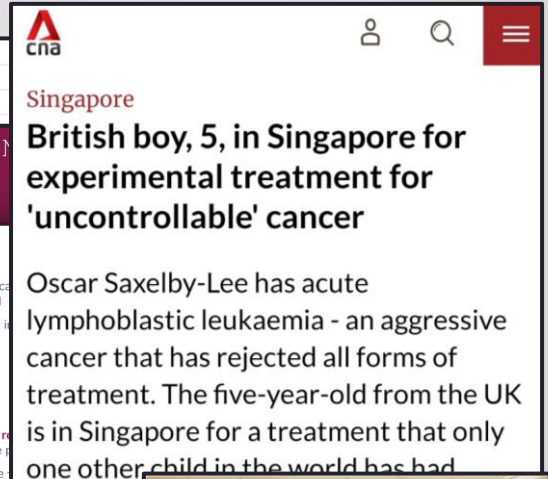
**“Caregivers not
enough”**

Chapter 2 – How Healthcare Has Evolved

Key shifts needed to sustain our healthcare system



- ◆ **Precision medicine** – genes/ environment/ lifestyle → predict disease risk, diagnose, tailor therapies & reduce complications
- ◆ **Nanotechnology**
- ◆ **New drug therapies** e.g. CAR-T Cell
- ◆ **AI, VR, AR, Pharmacy Automation & Robotics**



Deep Learning

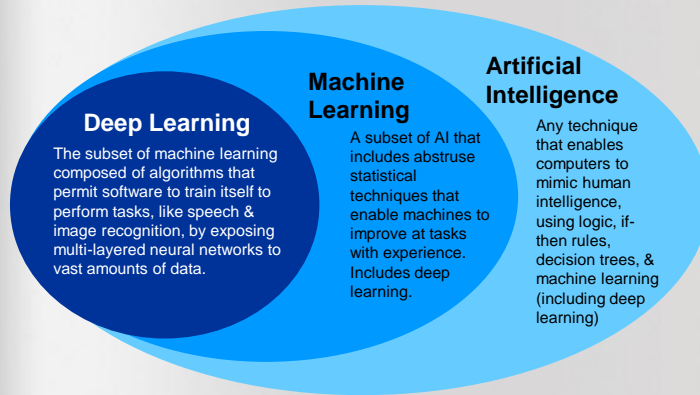
The subset of machine learning composed of algorithms that permit software to train itself to perform tasks, like speech & image recognition, by exposing multi-layered neural networks to vast amounts of data.

Machine Learning

A subset of AI that includes abstruse statistical techniques that enable machines to improve at tasks with experience. Includes deep learning.

Artificial Intelligence

Any technique that enables computers to mimic human intelligence, using logic, if-then rules, decision trees, & machine learning (including deep learning)



Deep learning algorithms use data stored in EHR systems to detect patterns in health trends & risk factors & draw conclusions based on the patterns they identify.

- Boston University & local hospitals monitor & predict with **82% accuracy** which patients with **heart disease & diabetes** will **require hospital care in the next year.**
- ***Doctor AI***, a model that uses information including ICD codes from patient's previous hospital visits & the time elapsed since the most recent visit → **predict when a future hospital visit will take place, for a patient & the reason why.**





































Relationship-based communication, Motivational Interview

- **Person Centred Care**
 - treating a person with dignity/ respect
 - involve them in all decisions
- **Patients taking charge** of their health & healthcare



Chapter 3

- Generation Alpha









Category	Builders	Baby Boomers	Generation X	Generation Y	Generation Z	Generation α
Name origin	The generation that built the economy, infrastructure and society after the Depression and WW2.	The post-war baby boom that created an economic boom.	Ironically named after Douglas Coupland's anti-label moniker - "just call us X". Note: spans 15 years.	The letter that followed X, also known as Millennials.	Following from Y, the end of an era and the end of a millennium.	Coined by McCrindle to define the start of a whole new era. Follows scientific naming (Greek alphabet).
Slang terms	 <p>We prefer proper English if you please</p> <p>Born: < 1946 Age: 75+</p>	 <p>Be cool Peace Groovy Way out</p> <p>Born: 1946-1964 Age: 56-74</p>	 <p>Dude Ace Rad As if Wicked</p> <p>Born: 1965-1979 Age: 41-55</p>	 <p>Bling Funky Doh Foshizz Whassup?</p> <p>Born: 1980-1994 Age: 26-40</p>	 <p>lit fam bae slay yass queen</p> <p>Born: 1995-2009 Age: 11-25</p>	 <p>extra flex yeet insta GOAT</p> <p>Born: 2010-2024 Age: under 11</p>
Social markers	World War II 1939-1945	Moon landing 1969	Stock market crash 1987	September 11 2001	GFC 2008	Trump / Brexit 2016
Iconic cars	 <p>Model T Ford Final, 1927</p>	 <p>Ford Mustang 1964</p>	 <p>Holden Commodore 1978</p>	 <p>Toyota Prius 1997</p>	 <p>Tesla Model S 2012</p>	 <p>Autonomous vehicles 2020s</p>
Iconic toys	 <p>Roller skates</p>	 <p>Frisbee</p>	 <p>Rubix cube</p>	 <p>BMX bike</p>	 <p>Folding scooter</p>	 <p>Fidget spinner</p>
Music devices	 <p>Record player LP, 1948</p>	 <p>Audio cassette 1962</p>	 <p>Walkman 1979</p>	 <p>iPod 2001</p>	 <p>Spotify 2008</p>	 <p>Smart speakers Now</p>
Leadership styles	 <p>Controlling</p>	 <p>Directing</p>	 <p>Coordinating</p>	 <p>Guiding</p>	 <p>Empowering</p>	 <p>Inspiring</p>
Screen content	 <p>Cinema</p>	 <p>TV</p>	 <p>VCR</p>	 <p>Internet</p>	 <p>Device</p>	 <p>Streaming</p>

Generation Alpha - Who are They?

- ❖ Children born from 2010 to 2025.
- ❖ Children of the Millennials.
- ❖ Born along with iPhones, iPads, & applications ... can't imagine how life was without them.
- ❖ The most materially endowed generation ever.
- ❖ Were told that they could be anything they wanted to be
- ❖ The most technologically savvy generation ever.



Generation Alpha – The World They Live In

-  This is the great screen age in which we are all living in.
-  Has a larger impact on Gen Alpha who is exposed to such screen saturation during their formative years.
-  Generation “Glass” = “Glass” that
 -  they will wear on their wrist
 -  they will wear as glasses on their face
 -  will be on the display of the driverless car they are transported in
 -  will be on the interactive school desk where they learn
 -  will transform how they work, shop, learn, connect & play



Generation Alpha – How they Are & What They Do

- ◆ From **shorter attention spans** to the gamification of education.
- ◆ From increased digital literacy to **impaired social formation**.
- ◆ They **shape the social media landscape**, are the popular culture influencers & the emerging consumers.































Generation Alpha – Developing Them

- Personalized learning programmes that focus on **critical thinking, problem-solving, cultural sensitivity, & environmental awareness.**
- Importance of **physical & mental health** in the process of learning.
- Focus shift to **social, moral & holistic development.**
- Many **digital play-and-learn platforms** using augmented reality & other technologies unlocked a whole new dimension of interactive experiences that are rich, engaging & meaningful.
- **Preparing a generation for a ~~healthcare system that~~ ^{do have some idea about} ~~world we cannot imagine~~, & jobs ^{are evolving} ~~that don't currently exist~~. The best we can do is to continually innovate, reinvent, & stay invested in ~~their growth~~.
^{the growth of all our staff.}**

Generation Alpha



- ◆ Grew up during a pandemic, recession, mental health epidemic, remote work experiment, & technological revolution.
- ◆ All of which defined the Alpha's as a generation & have a lasting influence on whom they've become.
- ◆ **At the end of 2020s, they moved into adulthood & joined our Healthcare workforce.**

CATEGORY	BUILDERS	BABY BOOMERS	GENERATION X	GENERATION Y	GENERATION Z	GENERATION α
Name origin	The generation that built the economy, infrastructure and society after the Depression and WW2.	The post-war baby boom that created an economic boom.	Ironically named after Douglas Coupland's anti-label moniker - "just call us X". Note: spans 15 years.	The letter that followed X, also known as Millennials.	Following from Y, the end of an era and the end of a millennium.	Coined by McCrindle to define the start of a whole new era. Follows scientific naming (Greek alphabet).
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Social markers	World War II 1939-1945	Moon landing 1969	<ul style="list-style-type: none"> Work with Gen X, Gen Y, Gen Z (Millennials) Gen Y & Z will helm leadership & management positions 			
Iconic cars	 <p>Model T Ford Final, 1927</p>	 <p>Ford Mustang 1964</p>				
Iconic toys	 <p>Roller skates</p>	 <p>Frisbee</p>				
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Chapter 4 - Pharmacy

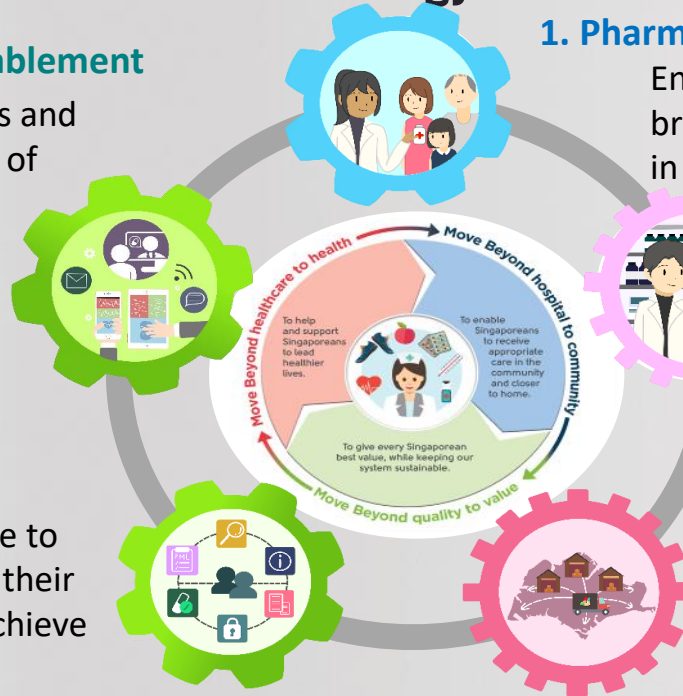
The National Pharmacy Strategy aligns to key shifts in the healthcare transformation strategy

5. Technology Enablement

Delivering seamless and effective transition of care across all care settings through technology as an enabler.

4. Information Enablement

Empowering people to get the best out of their medications and achieve care goals.



1. Pharmaceutical Care Excellence

Enhancing pharmacy services that bring health and value for everyone in our community

2. Confident Pharmacy Workforce

Providing a skilled, future ready & innovative pharmacy workforce

3. Re-design Supply Chain

Delivering seamless, convenient, accessible, affordable and safe medications at every point of care.

Pharmaceutical Care Enablement

Confident Pharmacy Workforce

Re-design Supply Chain

Information Enablement

Technology Enablement

1.1 Establish the role of pharmacy in the community care setting

Patients and consumers have increased access to trusted pharmacy services within community care, from receiving guidance and support on preventive health through to managing long term conditions.

1.2 Improve drug stewardship in non-acute care settings

Community pharmacy services will ensure that medication interventions are coordinated so that patients / consumers receive safe and effective use of medications to improve their health outcomes.

1.3 Establish collaborative models of care for medication reconciliation

Healthcare teams work in partnership with patients, empowering them to actively manage their medication list to get the best health outcomes.

1.4 Implement a clinical governance framework for medication management

A clinical governance framework supports medication management services to deliver care that is patient-focused, standards driven and consistent.

1.5 Promote pharmacists as part of the multidisciplinary healthcare team

Patients receive holistic care delivered by coordinated, integrated teams, which include pharmacy professionals, to deliver a seamless experience and engage patients and families along the care journey.

2.1 Implement Development Framework for Pharmacists

Competency continuum for pharmacists to progress from early career to advanced practice

2.2 Establish pharmacy residency programmes

Training for development of specialist pharmacists to provide specialized pharmaceutical care services.

2.3 Enhance pre-registration -pharmacist training programme

A holistic programme that integrates experiential learning across settings for development of pharmacists at entry-level.

2.4 Develop and train pharmacy technicians

Developmental pathway to strengthen the core competencies of pharmacy technicians from entry to advanced levels.

2.5 Build up manpower capabilities for community care setting

Manpower capabilities will be developed to support community care practices.

2.6 Build capability in collaborative prescribing

Enhance the role of pharmacists as part of multi-disciplinary team-based care.



3.1 Centralise procurement, packaging, compounding and distribution

Consolidating operational functions to drive efficiencies and economies of scale, giving patients and consumers affordable and readily available medications.

3.2 Deliver medications when patients need it, where patients need it

Patients / consumers have timely, convenient access to medications supported by expertise and advice from pharmacy services.



4.1 Deliver a common platform to stimulate and share clinical, practice-based research and innovation

Sharing research, innovations and new ways of working will stimulate Pharmacy to address challenges in the healthcare landscape and transform practice to deliver better standards of care.

4.2 Increase consumer and patient access to contextualised health information and education

Access to personalised health information resources will empower patients and consumers to proactively manage their medications and health.

4.3 Establish a National Drug Formulary (NDF)

A national comprehensive resource to establish standardised and safe use of medications supported by best clinical practices.

5.1 Standardise drug terminology and code structures for seamless communication and accurate transfer of information

Standardised terminology and code structures will enable care providers to communicate more easily, ensuring a safe and seamless transition between care settings for patients.

5.2 Provide a common pharmacy system for harmonised medication dispensing and implement a national charging engine to streamline the medication-related billing process – NHIPS (National Harmonised Integrated Pharmacy System)

A common pharmacy system will harmonise dispensing and billing, enabling pharmacists to deliver a seamless, more cost-effective service.

5.3 Enhance telepharmacy services

Telepharmacy will deliver quality pharmaceutical care to patients in a manner that is convenient for them, at their point of need.



**5 tracks and
19 initiatives**



Pharmaceutical Care Services



- ❖ Delivering Pharmaceutical Care Services to **empower and support seniors & caregivers** to manage medications independently in the community
- ❖ **Engage seniors and caregivers in the community** to develop a personalised plan to take their medications
- ❖ Coordinate with **multi-disciplinary care team across care settings**
- ❖ **Regular follow-up** with seniors & caregivers on medications
- ❖ Engagement of **lay extenders** to help seniors & caregivers



Towards a progressive and confident pharmacy workforce



Development Framework for Pharmacists

National Pharmacy Residency Programmes

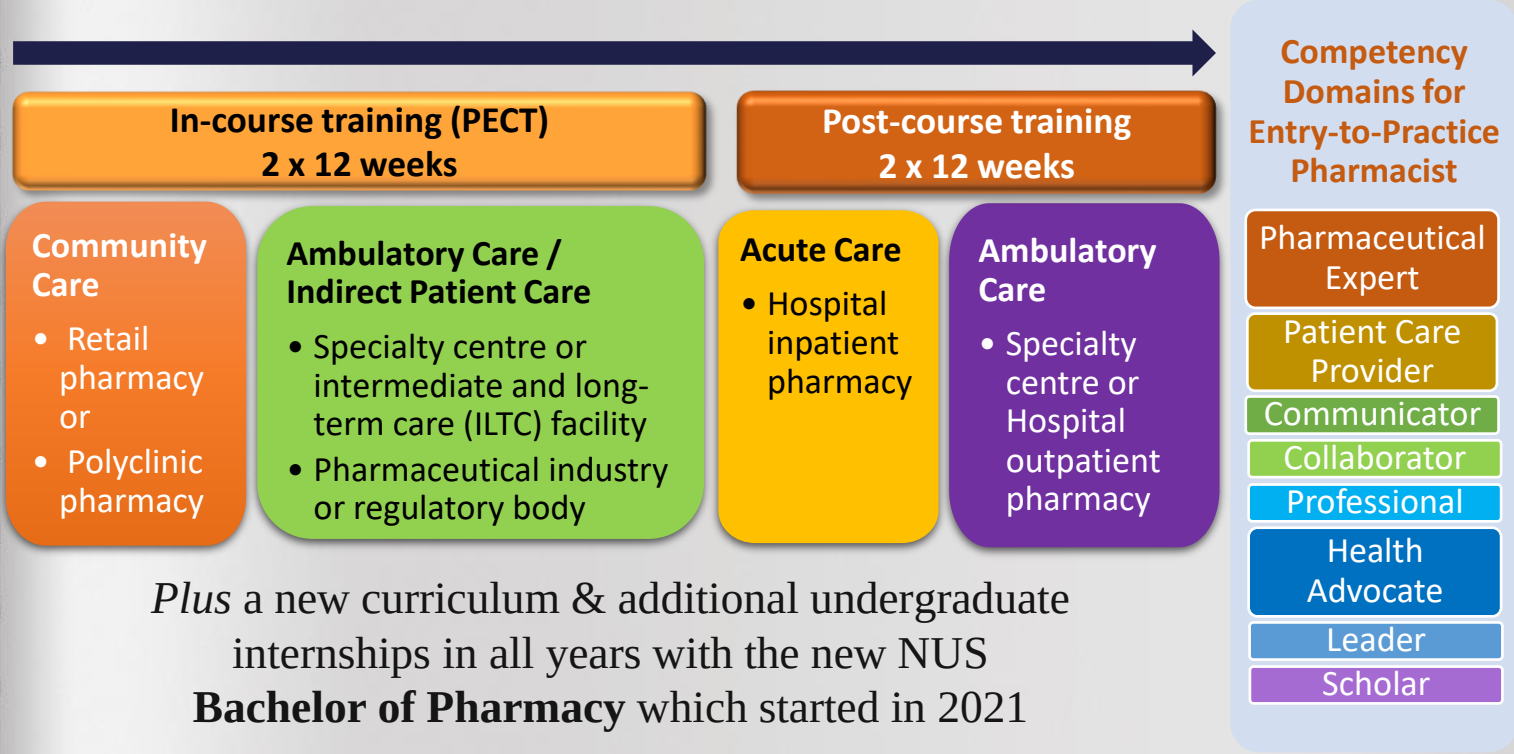
Enhanced Pre-registration Training

Developing and Training Pharmacy Technicians

Building Manpower Capacity for Community Practice

Collaborative Prescribing Practice

Pharmacists will be better prepared for the workforce



Development Framework for Pharmacists

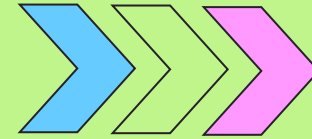


Continuum of progression towards 8 key roles:

1. Care Provider
2. Collaborator
3. Communicator
4. Leader
5. Advocate
6. Manager
7. Educator
8. Researcher - Innovator



Empowering pharmacists to take charge of their professional development through life-long learning.



Transition from foundation to advanced practice

1. Expert Professional Practice
2. Building Working Relationships
3. Leadership
4. Management
5. Education, Training & Development
6. Research & Evaluation
7. Professionalism

Build up Manpower Capabilities for Community Care Settings

Structured foundation training

On-the-job training for seamless transition towards advanced practice

Graduate Certificates in Community Practice

Part-time blended learning with community attachments

Community of Practice

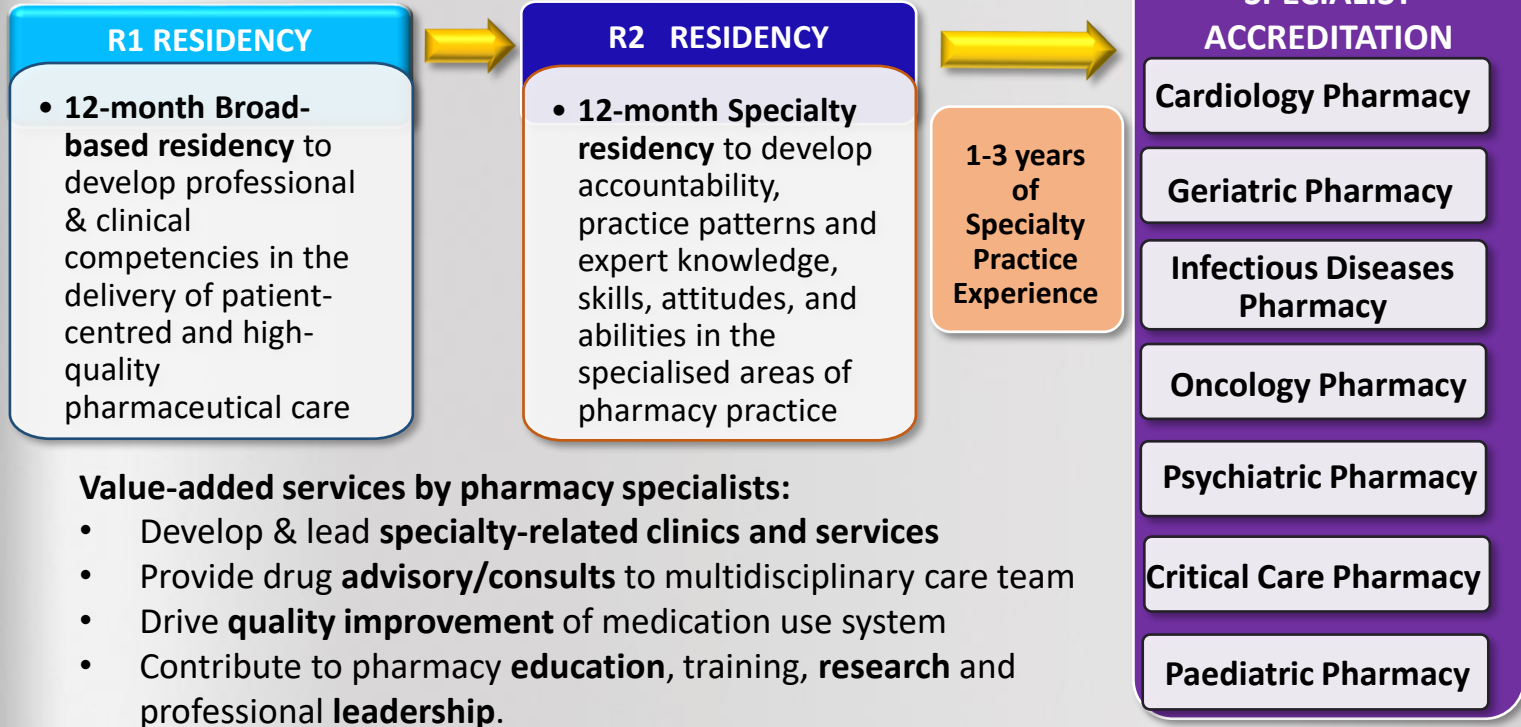
For sharing of best practices and sector-wide peer support networking



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Raising competencies of pharmacists in community practice with **broad-based knowledge** & skills from **preventive to end-of-life** care to practice community care.

National Pharmacy Residency Programmes



Collaborative Prescribing Practice

Empowering Pharmacists through the National Collaborative Prescribing Programme (NCPP)

- **Empowered to prescribe medicines & order tests** within a collaborative framework overseen by doctors
- Expansion of pharmacist-led patient care services



Graduation of 2nd Cohort of the NCPP in November 2018

Graduation of 3rd Cohort of the NCPP in May 2019

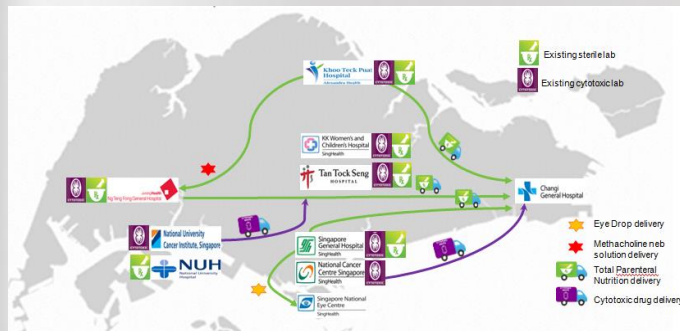
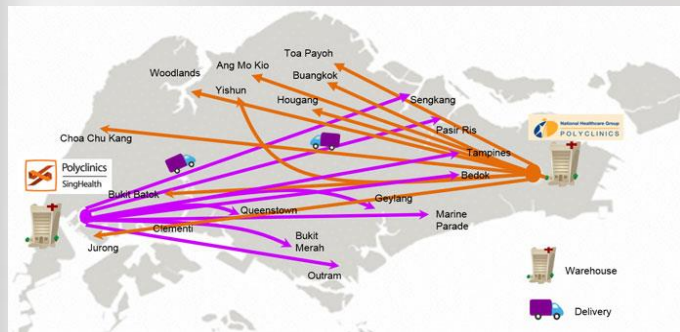
Career Development Pathway (CDP)

Director/ Head of Department					Advanced / Expert
PROFESSIONAL	CLINICAL SPECIALIST	CLINICAL	EDUCATION	RESEARCH	
Pharmacy Practice Manager	Specialist Pharmacist (Specialty Area)	Senior Principal Clinical Pharmacist	Clinician Educator	Senior Principal Pharmacist Researcher	
Principal Pharmacist		Principal Clinical Pharmacist	Principal Pharmacist Educator	Principal Pharmacist Researcher	Intermediate / Advanced
Senior Pharmacist		Senior Clinical Pharmacist		Senior Pharmacist Researcher	
Pharmacist		Clinical Pharmacist			Foundational
Pharmacist					

The competency framework & CDP has evolved over the years to ensure a future ready workforce

Centralise Procurement, Packaging, Compounding & Distribution

Landscape in 2021



Current Integrated Landscape in 2040



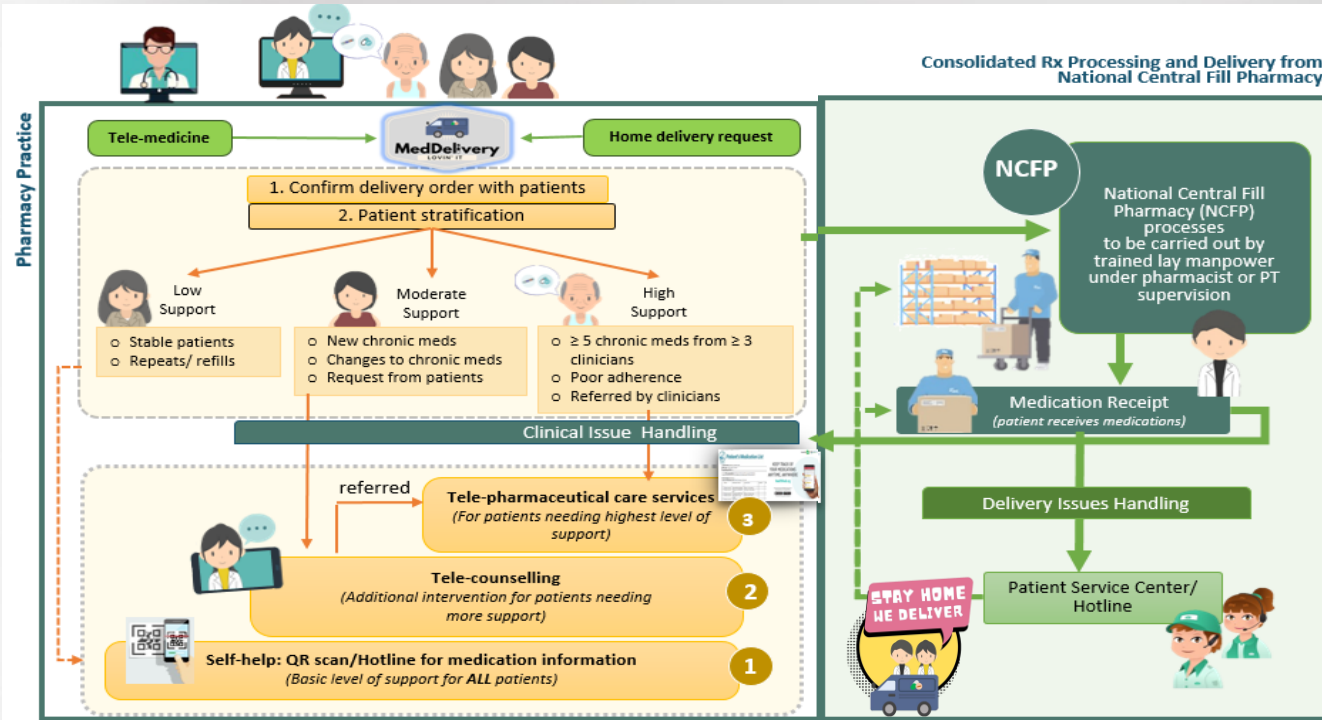
System-wide Benefits

Improve cost savings, efficiency & productivity

Scalable to meet increasing demands & resiliency

Improve overall safety, patient satisfaction & confidence

Transformation of medicine delivery services that is integrated with pharmaceutical care services to meet patients' needs.



National Harmonised Integrated Pharmacy System (NHIPS)

To consolidate patient medication management & supply at the public healthcare pharmacies onto a **common digital platform**, enabling more efficient work processes & access to service or information by the patients, which will transform the care delivery.



Patients and Caregivers

Improve accessibility of medications to all patients where and when they need it for seamless patient care.

Facilitate **multi-channel communication** for patients and caregivers.



Service Provider

Facilitate pharmacists to **access comprehensive medication history** and patient active medication list for medication reconciliation.



National Level

Facilitate **medication information exchange** and system interoperability through data standardization and harmonization.

THANK YOU

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Let's Co-Create our Vision ...

New Normal, even if COVID never happened:

- Foresight – Paradigm Shifts – Transformational
- Agile & Responsive to changes/disruptions
- Speed, Scalability for greater impact
- Quantifiable impact & measurable outcomes
- Resilience
- Learning Mindset

***Robust System of
Supply of Medication
in our Nation***

***Practicing at the
Top of the Licence
as generalists or specialists***

***An engaged workforce
that finds meaning &
purpose in what they do***

Leverage on Technology
Quality, Safety,
Productivity, Value

Leadership

- At all levels
- For all medication related matters
- For Healthcare

Engage & Empower Patients
What Matters Most?

National Pharmacy Strategy

5 tracks, 19 Initiatives

- Pharmaceutical Care Excellence
- Confident Pharmacy Workforce
- Re-design Supply Chain
- Information enablement
- Technology Enablement

***Public at large know
how pharmacists can
impact their lives***

***More of the Same
with an ageing
population***