



Looking Beyond Covid-19: The Healthcare Ecosystem in Taiwan

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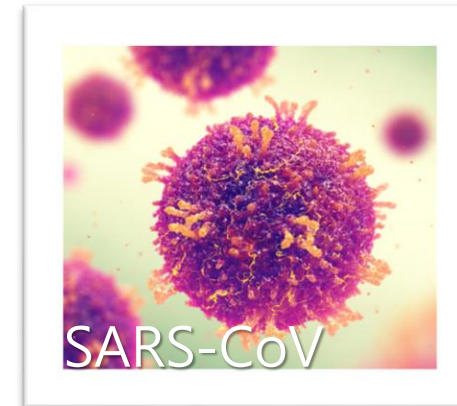
2020.08.08

Pandemics Overview

2002 – 2003 **SARS** (severe acute respiratory syndrome)

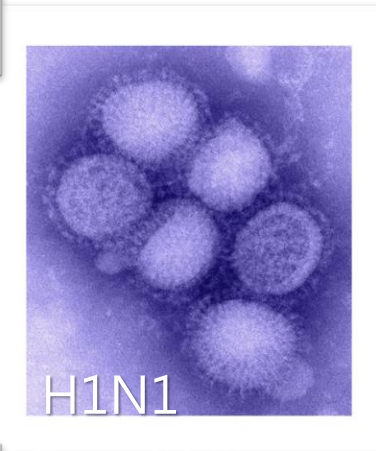
8,096 cases, 774 deaths

In Taiwan, 346 cases, 73 deaths



2009 – 2010 **H1N1 influenza**

1,311,522 cases, 14,142 deaths



2012(MEA) **MERS**

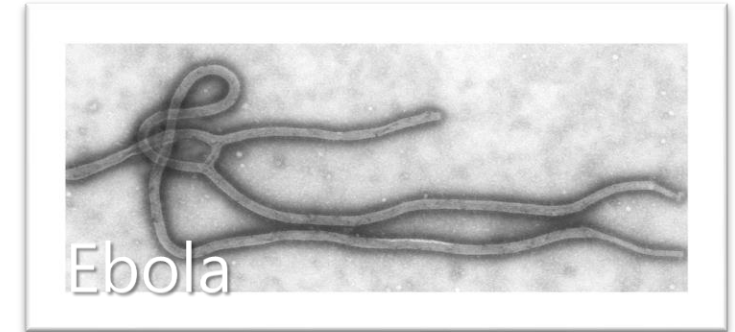
2015 (Korea)

2,494 cases, 858 deaths



Pandemics Overview

2014 – 2016 **Ebola** outbreak in W. Africa
28,610 cases, 11,308 deaths



Found in 1976

2019/12~ **Covid-19**
19,261,406 cases, 717,717 deaths
(as of 6 Aug. 2020)



In Taiwan, 477 cases, 7 deaths (as of 6 Aug. 2020)

Be prepared for the new normal

A major restoration of disruptive innovation in life, industry, technology and healthcare have become imaginable.

What is our response to the new normal then?

From Covid-19 crisis comes an opportunity: Taiwan

- Healthcare supply chain
- Emerging technology
- Biomedical industry the blue ocean
- Export of healthcare services

中華民國109年4月1日 / 星期二 <https://ctee.com.tw> 財經要聞 A3 工商時報

全球抗疫：台灣產業如何化危機為轉機

生策會會長/翁啓惠、副會長/楊洋池、林百里、蔡長海聯合撰文

防疫科技研發 政院砸5.6億

【本報台北報導】防疫科技研發有成，行政院13日宣佈，未來在「醫療防疫科技研發」規劃，將投入5.6億元，進行「檢測醫學」及「防疫工程」工作，亦將提高台灣檢測設備研發經費，協助國內廠商研發，並與國際三方合作研發疫苗等合作關係。

行政院13日政院宣佈將提高醫療防疫科技研發經費，由原來的1.5億元，增加至7.1億元，其中5.6億元將用於「檢測醫學」及「防疫工程」工作，其餘1.5億元則用於「疫苗研發」及「醫療設備研發」。

行政院長蔡揆在政院院會中，強調防疫科技研發是當前最優先的任務，政府將全力支持，並與國際三方合作研發疫苗等合作關係。他呼籲民間企業積極參與，共同提升台灣的防疫能力。

生策會會長翁啓惠表示，台灣擁有完整的醫療產業鏈，從原料、設備到研發，具備化危機為轉機的能力。他呼籲政府與企業加強合作，共同提升台灣的防疫科技水平。

副會長楊洋池、林百里、蔡長海也分別就檢測醫學、防疫工程、疫苗研發等領域發表了看法。他們認為，台灣在這些領域具有技術優勢，應進一步加大研發投入，提升國際競爭力。

生策會擬發表產業白皮書

【本報台北報導】生策會擬發表產業白皮書，內容包括：防疫科技研發、醫療設備研發、疫苗研發等。白皮書將分析台灣在這些領域的現狀、優勢與挑戰，並提出具體的發展建議。生策會表示，將與政府、企業、學術界等多方合作，共同推動台灣醫療產業的發展。

Healthcare Supply Chain

Supply-chain flexibility as part of national affairs

- Taiwan provides and relies on imports, and revise national strategies for industry development accordingly.
- Despite having 20+ years of expertise in diagnostics, medical devices, API, vaccines and biologics, Taiwan holds no control over provision of raw materials and core components.
- Gauge options for locally-supplied raw materials, parts and components, reach out to new suppliers and strategic partners (with proximity to Taiwan and/or being able to manage ad-hoc requests).

Emerging Technology

Widening and accelerating the global competition in healthcare innovation

- Technologies, both experimental and developing, have been granted access to fight Covid-19 under the **Emergency Use Authorization (EUA) framework**.
- The global pandemic presents an unprecedented opportunity for new tech to be tested or applied straightaway, which could change people's lives to some extent.
- **Would Taiwan, as an ICT star, still shine after Covid-19 being put to an end?**

Biomedical Industry the Blue Ocean

Where global standards in healthcare to be made

- Globally, the healthcare system, workforce, facilities, technologies and resources have been placed under inspection in the post covid-19 era.
- Replacement of facilities, implementation of medical AI, contactless patient care and so forth- it's there, the demand.
- Taiwan's strategic move towards setting universal standards in healthcare ranging from patient care, technology implementation to medical equipment, and bringing together ICT and medicine, will fulfil unmet needs eventually?

Export of Healthcare Services

With Taiwan's excellence and expertise now known worldly

- Solutions such as diagnostics, infection control, clinical guidelines, smart hospitals and data-driven medical care development, should be shared with intl' allies, in addition to Covid-19 how-to.
- In which areas (e.g. IT systems, hardware, solutions, modules) appropriate for Taiwan to proceed with as a critical provider?
- Going forward, what would be Taiwan's approach to have the supply chain around medical advances seen by and led the global market?

Emerging tech and application for COVID-19

Diagnosis

- Testing kits
- Mobile diagnostics
- Temperature monitoring
- Medication
- Vaccine development
- Therapeutics

Prevention

- Antiviral masks
- Disinfectants
- Air filtration
- Disease surveillance
- Spit disposal
- Environmental monitoring for diseases

Patient care

- Hospital robots
- Medical AI algorithms
- PPEs
- Artificial cough device
- 3D-printed ventilator valves

Remote healthcare

- Remote monitoring
- Telehealth
- **Wearable sensors**
- **Vital sign monitors**
- Digital stethoscope
- Chatbots
- 5G telecom

Source: Startus Insights、FDA、IBMI

Emerging tech and application for COVID-19

Public health

- Drone delivery
- Isolation units
- Visualised dashboards for covid-19 outbreaks and forecasts
- Patrol/disinfection robots
- Mobile Apps

Smart city

- Smart surveillance
- Location-based systems
- Online civic services
- Indoor farming
- Unmanned stores
- Prefabricated & modular construction
- Sickness mapping

Industry

- Real-time supply chain management
- Fleet management
- Autonomous cars
- AR
- Digital factory

Individual

- Shared streaming & entertainment
- Remote work
- Online learning
- Stress & anxiety reduction
- Food & grocery delivery
- Indoor workouts

Source: Startus Insights 、 FDA 、 IBMI

Advantages of Taiwan Medicine



Outstanding Healthcare Insurance System

- ❖ 99.6 % of Taiwan's 23.57 million people covered under the government-run National Health Insurance (NHI)
- ❖ Good accessibility-The NHI has a very high approval rate among Taiwanese people



High Quality Healthcare Services

- ❖ Out of 200 of the largest hospitals in the world, 14 are in Taiwan.
- ❖ Taiwan ranks third, just after the USA and Germany, in terms of medical service quality.
- ❖ shorter wait times for beds in large hospitals and medical centers



World-class Health Database

- ❖ National Health Insurance Research Database has been collected for more than 20 years
- ❖ Medical centers with complete medical record and imaging data

Advantages of Taiwan ICT industry



Most concentrated industry clusters

- ❖ World's densest and most technologically advanced semiconductor production base.
- ❖ The Major Procurement Center for Global ICT Companies & Buyers



Strong ICT manufacturing capabilities

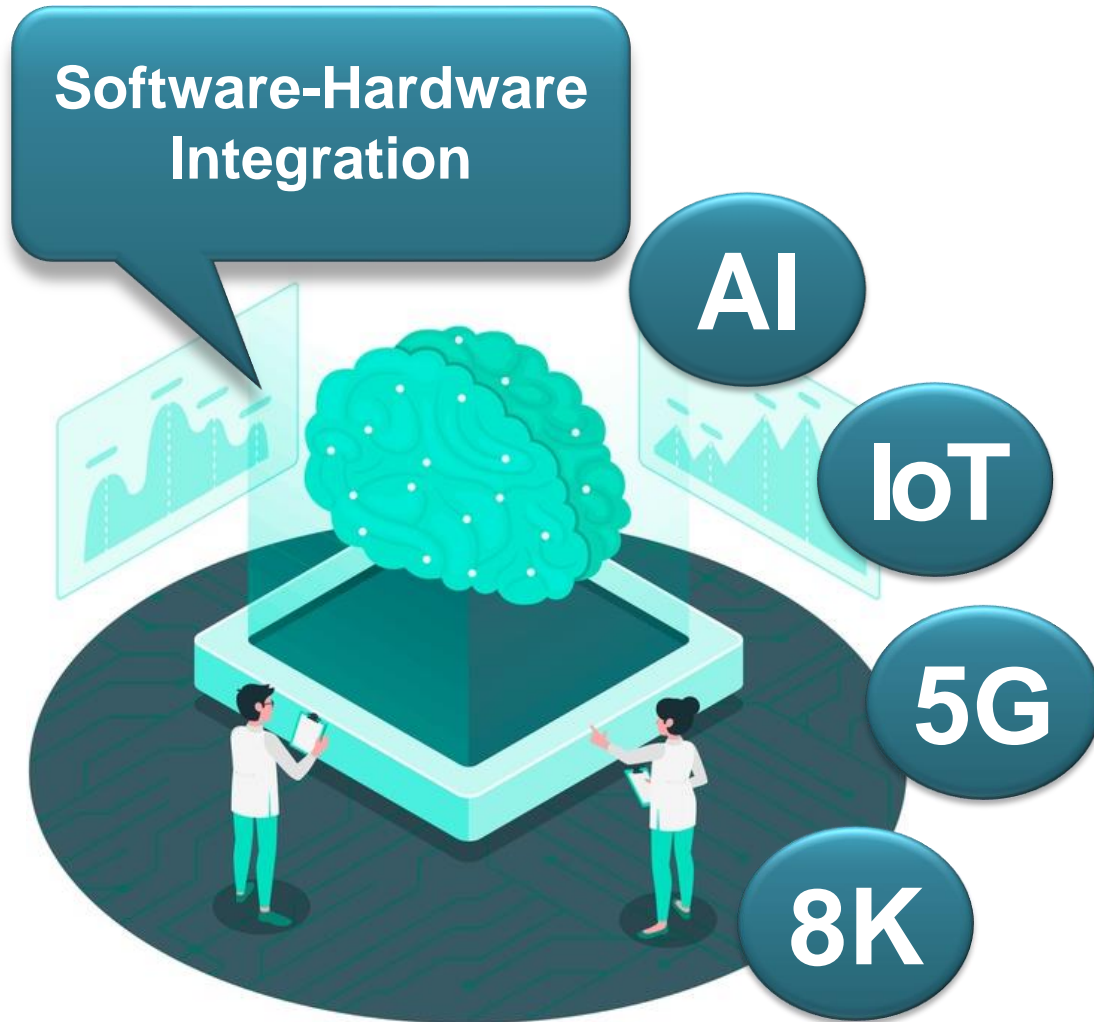
- ❖ **Rich manufacturing experience and outstanding technologies**
- ❖ The heart of the world's tech supply chain, offering high-quality products from IC design, semiconductor, to electronics.



Rapid Commercialization

- ❖ Ranked 1st in Worldwide Major ICT product market share for more than 10 products
- ❖ **High levels of hardware/software integration capability for flexible production and rapid commercialization**

Game-Changing Technology in Healthcare



Taiwan houses global players and supply-chain partners in the following areas.

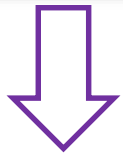
- **Software hardware integration**
- **AI** chip making, AI computing & servers
- **IoT** sensors and components
- **8K** display and 8K image technology
- **5G** telecommunication chips and peripherals



ICT



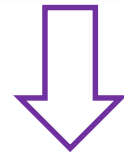
Hospital



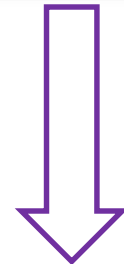
Smart Hospital



Healthcare IoT
Platform



Health AI



Medical &
Wearable Devices



Hospital
Equipment

Taiwan's ICT Sector in Healthcare

Precision Healthcare Industry

	Mobile health	Medical equipment	Smart hospital	Gene/cell therapy	Biomedicine	
Companies						
Product pipelines	<ul style="list-style-type: none"> ■ Tele-healthcare ■ IoT solutions ■ Wearables ■ Health management 	<ul style="list-style-type: none"> ■ X ray / ultrasound ■ Micro CT ■ Surgical / service robots ■ Capsule endoscopy ■ Hemodialyzer ■ Molecular pathology ■ Vital sign monitor 	<ul style="list-style-type: none"> ■ Smart ward/operating room ■ Surgical VR ■ AI solution ■ HMS ■ EMR / EHR ■ Medical display 	<ul style="list-style-type: none"> ■ DNA sequencer ■ DNA microarray ■ Protein & genetic testing ■ CTC system ■ Cellular therapy 	<ul style="list-style-type: none"> ■ AI chip ■ Biochip for gene sequencing ■ RF & Wireless chip ■ Biosensor ■ Display component ■ Organic semiconductor 	
Areas of application						

Taiwan Leading ICT Players into Digital Health



No. 24 of Fortune Global 500
No. 1 of EMS Providers Global



No. 432 of Fortune Global 500
No. 5 of EMS Providers Global



Top 10 Electronic ODM Global
Top 3 manufacturers of TFT-LCD



Quanta Computer
No. 354 of Fortune Global 500



No. 404 of Fortune Global 500
No. 1 of NB manufacturer Global



One of leading Industrial
Computer Providers Global



Top 3 Manufacturers of AMD
Graphics Cards



One of Leading EMS-ODM
Manufacturers Global



No. 5 of Best Laptop Brands 2018



No. 4 of PC manufacturer Global
No. 4 of Best Laptop Brands 2018



Top 3 DLP Projector Manufacturer
One of Leading LCD Backlight Module
Manufacturers Global



One of Leading Smartphone
Brands Global



Top 3 ODD manufacturers
Top 10 EMS Providers Global



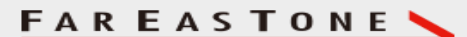
World's leading smartphone camera
lens supplier



One of leader in power and thermal
management solutions in the world



One of the Largest
Telecommunications Services Taiwan



One of the Largest
Telecommunications Services
Taiwan



Cell Therapy



睿田生技
Retain Biotech



台大醫院
National Taiwan
University
Hospital

Big Data Analysis on Genetics

Cancer MoonShot 2020 Project



FOXCONN

YongLin Healthcare Foundation



NantWorks



Chinese
Genome
Database



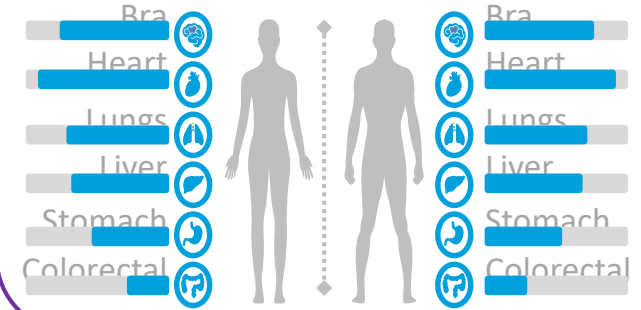
华大基因
BGI

Precision Medicine



康聯預防醫學
HEALTHCONN

Genetic Tests



FOXCONN



樂養健事業群
Healthcare Business Group

Healthcare Management



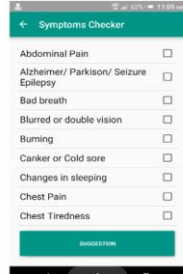
永悦健管
Yongyue Health
Management



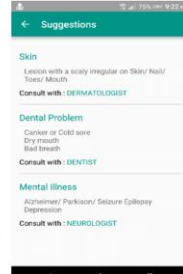
H2U LIFE



(a)



(b)



(c)

Molecular Detection

SHARP
LIFE SCIENCE

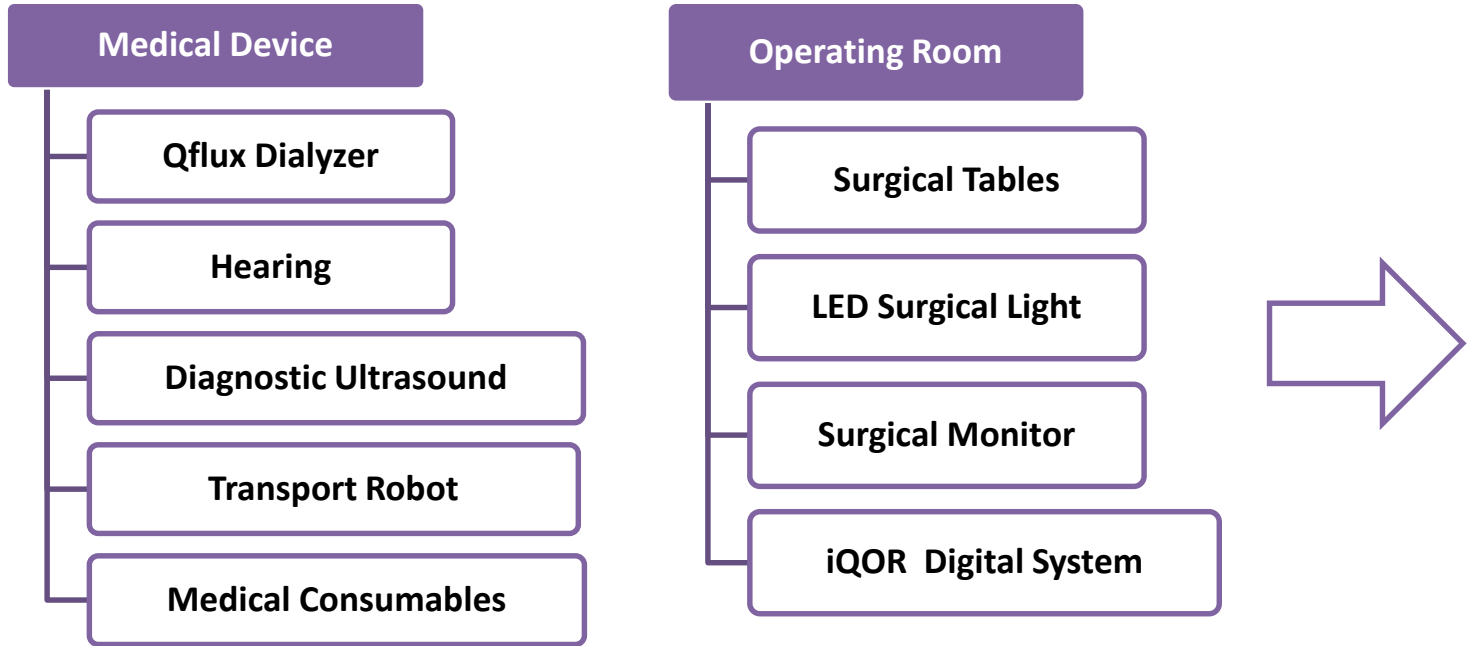
BioChip



睿軒檢驗科技
Rapidsure Tech

Food Science

Featured Products



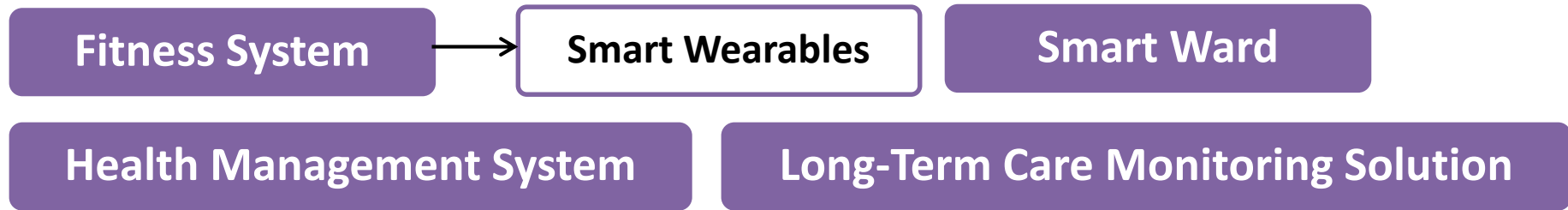
Solutions

Smart Operation Room



ODM / OEM of Medical Device

Other Smart Healthcare Solutions



Taiwan leading hospitals are expanding their productivity from building smart hospital...



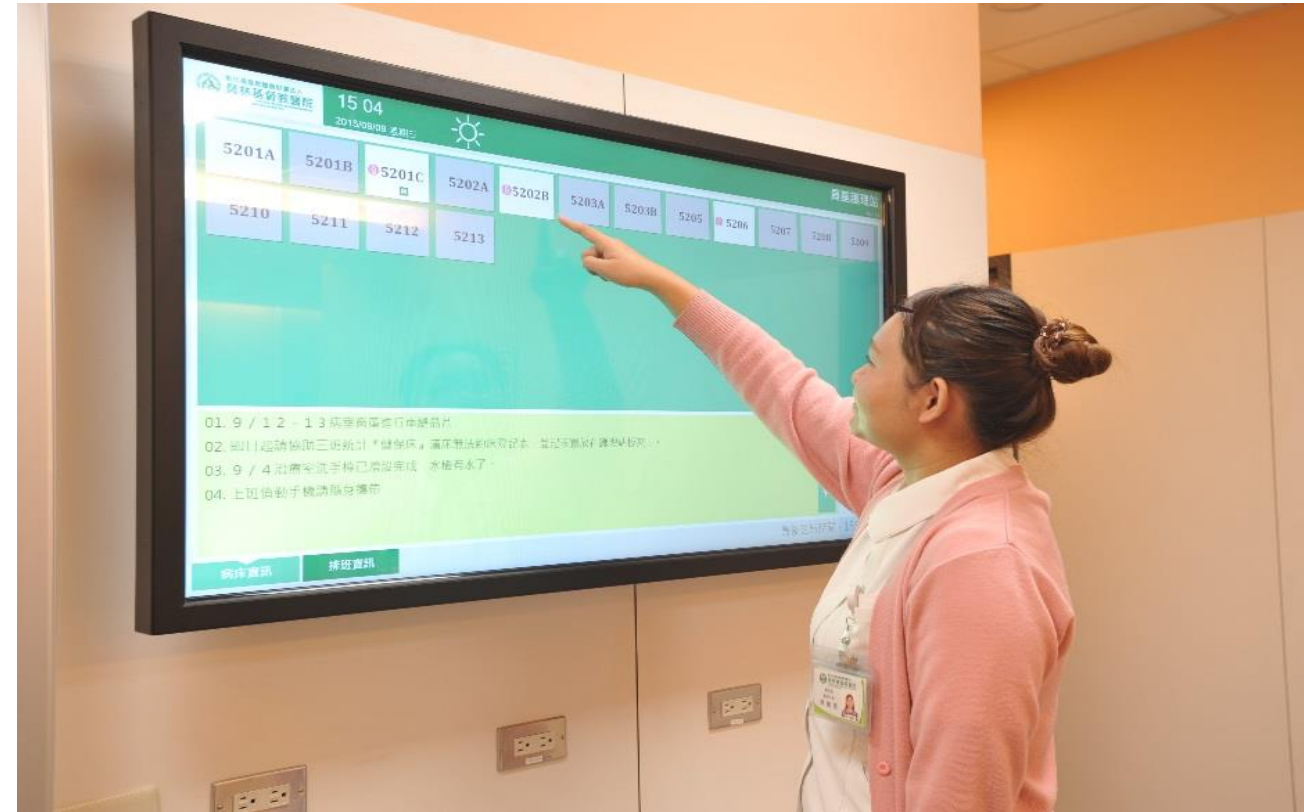
ICT Players launch products and solutions:

- ◆ Smart Nurse Station
- ◆ Smart Ward
- ◆ Smart Clinic
- ◆ Smart Counter
- ◆ Smart Dialysis
- ◆ Smart Operation Room
- ◆ Multimedia interaction
- ◆ Accompany robot
- ◆ Logistics Management
- ⋮

Smart Nurse Station: Nursing Dashboard

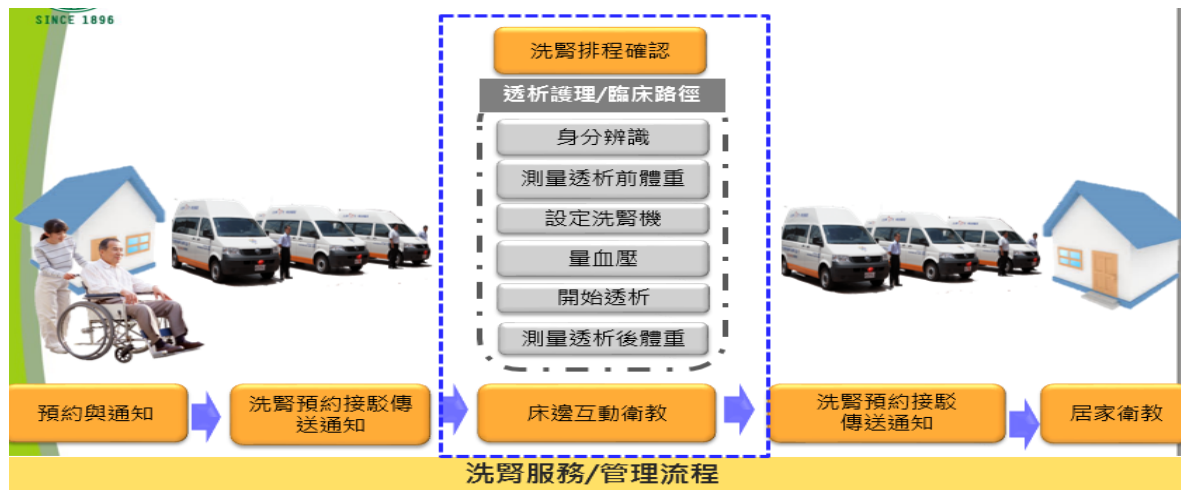
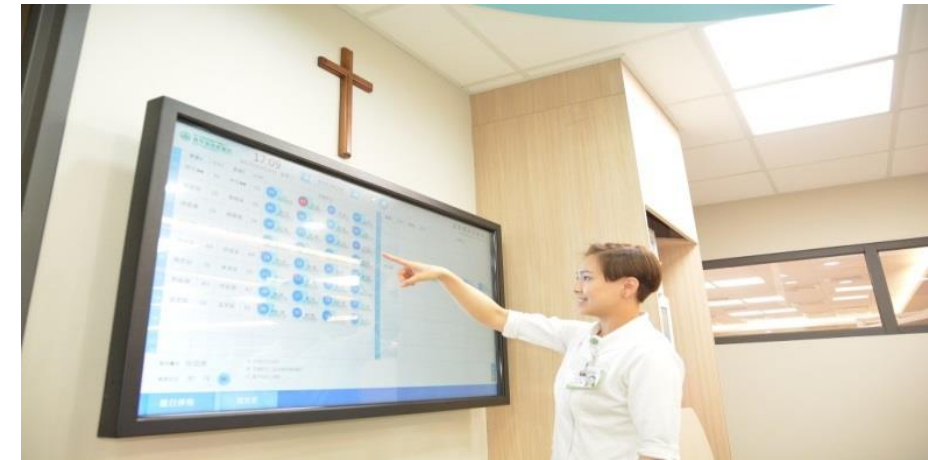
Improvement Nurse Care Quality and Work Flow

1. No paper works
2. Real time nursing shifting
3. Real time patient information (location, activity, schedule)
4. Pre-alarm system



Smart Nurse Station: i-Hemodialysis System

- ◆ Central nurse control panel
- ◆ Nurses dash board
- ◆ Patient information system
- ◆ Schedule, Work Flow, Education



Taiwan Healthcare 

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Advancing to a Better Life Together with Taiwan Healthcare⁺ !
A portal leads to world-class medical teams and excellent bio companies in Taiwan.

Taiwan Healthcare⁺

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Taiwan Healthcare⁺

Top-notch medical centers showcasing > 65 specialties

Bio B2B
Taiwan Healthcare⁺

Biomedical Companies showcasing > 400 technologies & products



For patients we provide high-quality, niche medical services, such as world-famous liver transplantation, craniofacial surgery, artificial reproductive technology, comprehensive minimally-invasive surgeries, and much more.

Patients from anywhere in the world can make an appointment directly with the medical team of their choice for an evaluation and subsequent medical treatment.

- 
- A background image showing a surgical team in an operating room. The surgeons are wearing blue scrubs and masks, and are focused on a patient lying on a table. The room is brightly lit with surgical lamps.
- Cancer Treatment
 - Cardiovascular Disease & Stroke
 - Dentistry
 - Diabetes & Chronic Kidney Disease
 - Ear, Nose & Throat
 - Fertility & Reproductive Health
 - Gastroenterology
 - Hepatology
 - Insomnia & Psychiatric
 - Neurology
 - Obstetrics & Gynecology
 - Orthopaedic
 - Pediatrics
 - Reconstructive & Plastic Surgery
 - Assisted Reproductive Technology
 - Minimally Invasive Cardiac Surgery
 - Catheter Ablation of Atrial Fibrillation
 - Living Donor Liver Transplantation
 - Complex Deformities Reconstruction
 - Dental implant surgery
 - Spinal Surgery
 - Epilepsy Surgeries



For medical professionals we provide hospital collaboration projects, including medical & clinical partnership and hospital management collaboration from leading medical centers in Taiwan.

Medical professionals can request collaboration directly with a medical team to discuss and evaluate opportunities.

Medical & Clinical Partnership

- Clinical Trial
- Research Collaboration
- Fellowship
- Physician Training
- Patient Transfer Collaboration

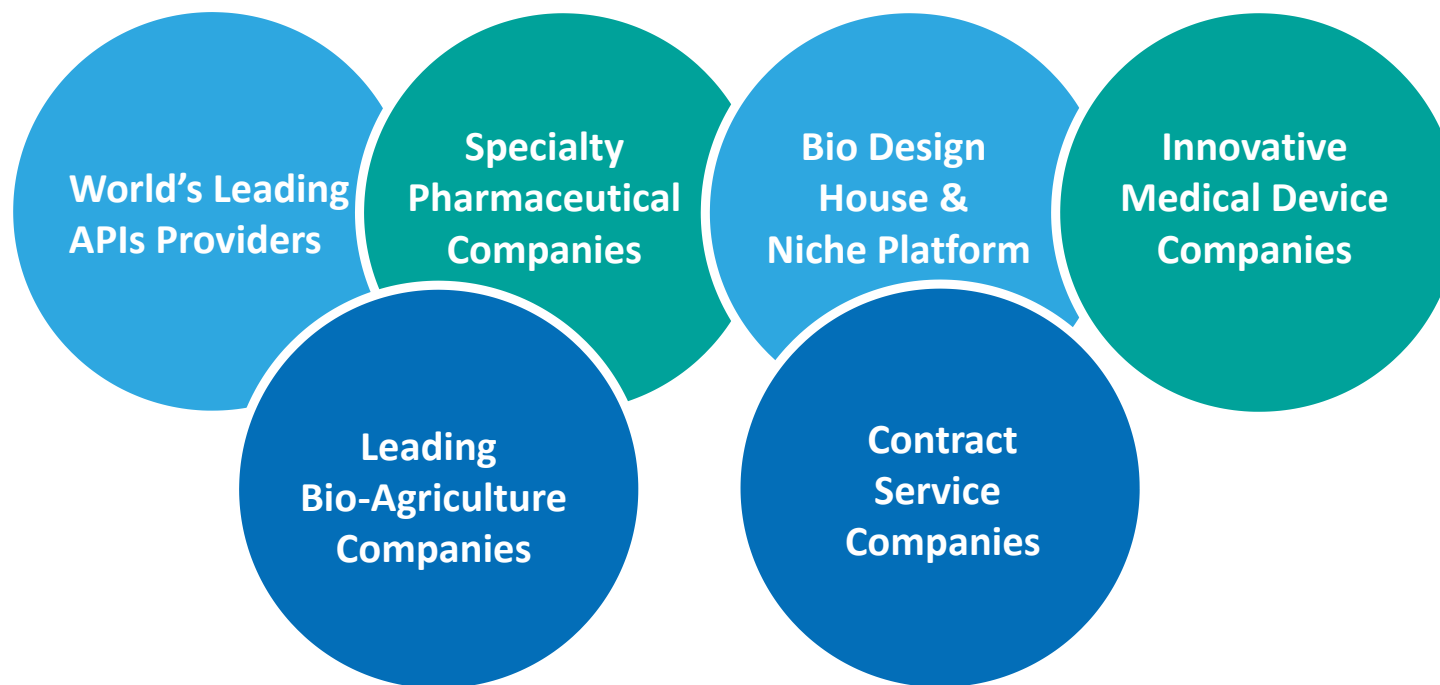
Hospital Management Collaboration

- Accreditation & External Evaluation
- Consultation & Training Program
- Hospital Contract Management
- Hospital Design, Planning & Building
- Hospital Information System

Bio B2B

Taiwan Healthcare⁺

Bio B2B is designed **for bio-business professionals** to find value-added partnerships in Taiwan in fields ranging from APIs, pharmaceuticals, and medical devices, to bio-agricultural and health supplement companies.





Healthcare⁺ EXPO · TAIWAN

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Most comprehensive **health care database** and electronic clinical data



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Themes

Epidemic Prevention

- Telemedicine
- Robotics
- Rapid test
- Infection control

AI in Healthcare

- Diagnostics
- Precision medicine
- Big data
- Cloud-based solution

Precision Health

- Mobile Health
- Smart home
- Health promotion



Welcome to TAIWAN

Thank you!