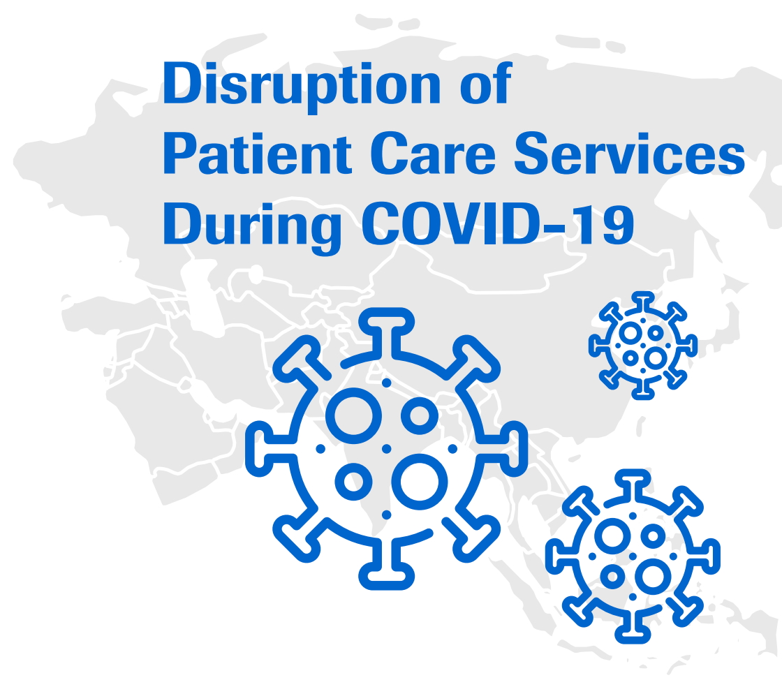


Disruption of Patient Care Services During COVID-19

Beyond COVID-19-related infections, hospitalisation and deaths, COVID-19 also disrupted important health services, aggravating the existing health crisis.

As of 1st July 2021, there are

>55 million confirmed COVID-19 cases and

>790 thousand confirmed COVID-19 deaths

in Asia, putting immense stress and burden on the healthcare systems in the region.[1]

The COVID-19 pandemic has resulted in:

Diagnostic shortages

due to inadequate planning and a limited health system response.[2]

Asia accounts for only **36%** of the global laboratory capacity for COVID-19 molecular assay testing when it is home to **60%** of the world's population.[2,3]

Greater demand for health care services and medical laboratory workers,

resulting in a shortage of ancillary health workers, including medical laboratory scientists.[4,5]

Disruption to essential health services

adversely impacting population health and posing serious threats to the post-pandemic health system recovery.[6,7]

Based on the World Health Organisation (WHO) Pulse Survey:

90% of countries reported disruptions to essential health services as a result of the COVID-19 pandemic.[6,7]

69% of countries reported non-communicable disease diagnosis and treatment to be adversely affected.[7]

55% of countries reported cancer diagnosis and treatments to be adversely affected.[7]

In Australia alone, the Cancer Council Australia estimated that in 2020, **over 1 million patients potentially missed their routine cervical screening test** due to COVID-19-related disruption, resulting in:[8]

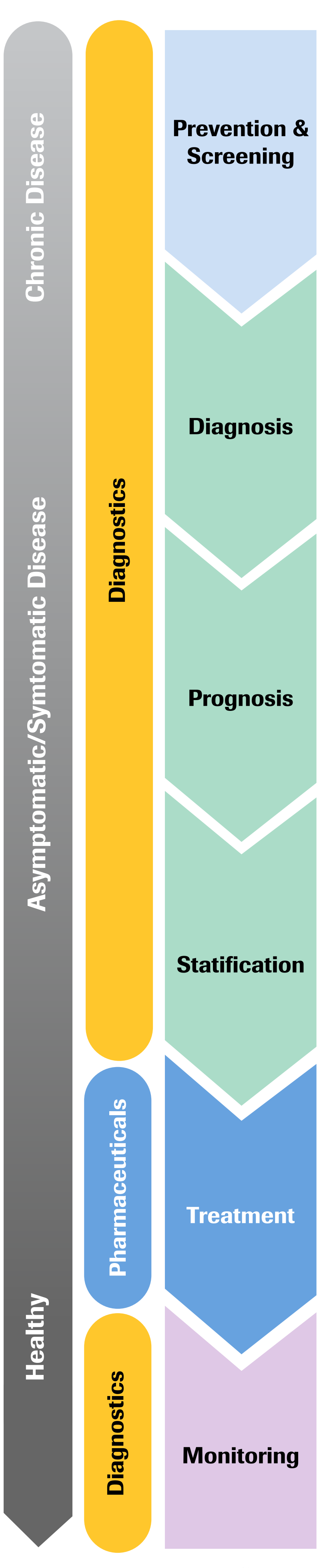
- more cervical cancer being diagnosed at a later stage
- less favourable survival outcomes
- more deaths

The Need for Appropriate Diagnosis

Effective employment of diagnostics across the healthcare spectrum can improve healthcare efficiency.

Diagnostics influence **up to 70%** of all clinical decisions yet account for **approximately 2%** of healthcare spend.[9,10]

> "All countries should **pay particular attention to the diagnostics space and use the Essential (Diagnostics) List to promote better health**, keep their populations safe, and serve the vulnerable,"
>
> WHO Director-General,
> Dr Tedros Adhanom Ghebreyesus[11]



Screening diagnostics allow for early detection of non-communicable diseases (NCDs), which enables the administration of cost-effective treatment before iseases become more advanced.[12,13]

Preventive screening to determine pre-eclampsia risk in pregnant women

- Pre-eclampsia is a serious condition that usually affects some women in the second half of their pregnancy.
- In 2017, approximately **82,400 women** died from pregnancy and childbirth-related causes in Asia Pacific alone, of which, approximately **14% of deaths (11,500 deaths)** are attributable to pre-eclampsia and eclampsia.[14,15]
- Strunz et al. reported that routine use of pre-eclampsia testing can reduce hospitalisation rates before pre-eclampsia diagnosis by 50%, and provide an annual cost savings of approximately USD 33 million to health systems (GBP 24 million).[16]

Among patients with active disease, diagnostics can assist diagnosis, prognosis and disease stratification to determine the most appropriate therapy.

The value of diagnostics in pandemic management[17]

- According to an Asia Pacific Medical Technology Association (APACMed) Whitepaper, supplementing vaccine roll-out with effective testing approaches remains essential to control and survey transmission of COVID-19 infections.
- Countries in Asia Pacific have adopted a wide array of screening and diagnostic tools to help manage the pandemic and limit its negative impact.
- South Korea, for example, has adopted Antigen Rapid Testing (ART) for public mess screening via convenient drive-through or walk-through stations. The aggressive screening and containment efforts have allowed South Korea to flatten the epidemic curve quickly without closing businesses, issuing stay-at-home orders, or implementing many of the stricter measures adopted by other high-income countries until late 2020.[18]

Among populations with chronic diseases, appropriate use of diagnostics can improve disease monitoring and provide patients and healthcare professionals (HCPs) with continuous feedback on disease status and management.

Reducing the burden on health systems through accurate diagnosis and appropriate monitoring

- Heart failure affects millions of patients and it is a life-threatening condition with poor quality of life and a high burden of hospitalisations and premature death.[19,20]
- The accuracy of diagnosis, based only on history and clinical assessment, is challenging, as symptoms are often difficult to interpret.[21,22]
- **Up to 50% of patients can be misdiagnosed** with all related adverse impact, such as inappropriate care or treatment, adding burden for patients and costs to healthcare systems.[22,23]
- Monitoring heart failure over time can help to identify which patients are stable or improving, and which are worsening and at high risk of hospitalisation or mortality.[24,25]

Adapted from Roche Diagnostics[26]

The right diagnosis and treatment at the right time for the right patient can positively impact the entire ecosystem.

Underinvestment in diagnostics can result in late and under-diagnosis of diseases, which lead to poorer health outcomes and higher healthcare costs

A study published in BMC Medicine noted that **over 70% of cancer cases in low- and middle-income countries in Asia are diagnosed at a late stage.** Delayed diagnosis is an important contributing factor for decreased survival rates.[27]

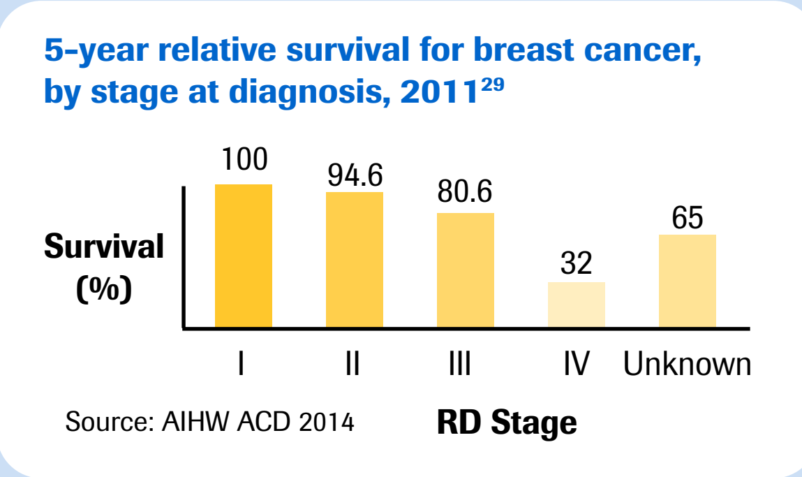
Reported late stage cancer diagnosis[28]

60% in Malaysia

70-80% in Vietnam

Later-stage cancer diagnosis decreases 5-year relative survival for breast cancer patients. This trend was also observed in other cancers.[29]

5-year relative survival for breast cancer, by stage at diagnosis, 2011[29]



Source: AIHW ACD 2014

A systematic review on global treatment cost of breast cancer by stage reported **increasing costs of treatment with later diagnosis.[30]**

Mean treatment costs[30]

41% Regional breast cancer

165% Distant breast cancer

Beyond patient care, aggregated diagnostic data can assist healthcare providers and policy makers in implementing evidence-based policies and management protocols, such as through:

Public-private partnership to support precision medicine adoption

A national-level partnership between the Singapore Translational Cancer Consortium (STCC), National Cancer Centre Singapore (NCCS), the National University Cancer Institute, Singapore (NCIS) and Roche was formed to advance the adoption of personalised health and improve outcomes for cancer patients.[31] Diagnostic insights from patients' clinical profiles can direct precise treatment decisions for patients, supplement clinical studies and optimise patient outcomes and utilisation of healthcare resources.

Global surveillance efforts to address infectious diseases like influenza

The World Health Organization (WHO) organises a biannual consultation with WHO Collaborating Centres, Essential Regulatory Laboratories and representatives of key national laboratories and academies. The consultation reviews the results of surveillance, laboratory and clinical studies, including the availability of vaccine viruses, and make recommendations for prospective influenza vaccines to anticipate upcoming influenza strains and prevent severe infections.[32]

Value-Based Healthcare (VBHC)

Improved cost-effectiveness and health outcomes as a result of timely diagnosis and interventions bring value to healthcare systems and stakeholders. Diagnosis supports value-based healthcare (VBHC) that aims to maximise quality improvement per dollar spend.

Michael Porter, a renowned economist defines patient value as **"patient-relevant outcomes, divided by the costs per patient across the full cycle of care in order to achieve these outcomes. Value-Based Healthcare focuses on maximising the value of care for patients and reducing the cost of healthcare"**, in his book *Redefining Health Care: Creating Value-Based Competition on Results.*[33]

$$\text{Value} = \frac{\text{Quality}}{\text{Cost}} = \frac{\text{Outcomes + Patient Experience}}{\text{Direct Costs + Indirect Costs}}$$

Benefits of Value-Based Healthcare

Patients	Providers	Payers	Suppliers	Society
Lower costs & better outcomes	Higher patient satisfaction rates & better care efficiencies	Stronger cost control & reduced risks	Alignment of prices with patient outcomes	Reduced healthcare spending & overall better health

VBHC does not solely focus on discrete treatments but the complete care cycle, as it consists of health outcomes aggregated from the entire care cycle and the associated total cost that makes up the end value. It is seen as a potential solution to unsustainable rising healthcare costs, where patient-centric care is encouraged as providers are paid based on the value of outcomes produced rather than the individual service provided.[33-36]

Opportunities with the implementation of VBHC

- Deeper understanding of the burden of disease[37]
- Administration of targeted therapies to improve health outcomes[38]
- Use of digital health technology to better track and monitor patient and health outcomes in real-time[39]
- Innovative payment schemes and outcomes tendering[34]

Challenges associated with the implementation of VBHC

- Alignment of financial incentives across industry sectors[40]
- Change in practices and the adoption of digital technologies[39]
- Requirement for high quality and seamless healthcare infrastructure[39]
- Optimisation and interpretation of electronic health record data[41]
- Collection and reporting of quality measures[42]

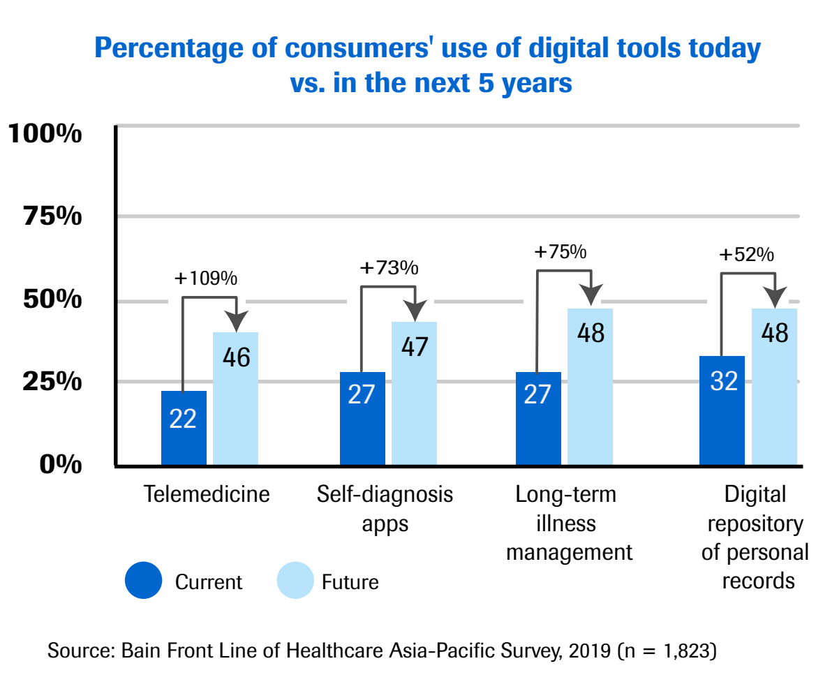
Innovations supporting the transition to VBHC

New technologies and innovations are transforming the patient journey and they can increase value in healthcare and improve patient care readiness.

Healthcare providers and patients are expecting innovations and technology to play a bigger role in patient care.

1,823 consumers surveyed in APAC showed **increasing consumer interest in the use of digital health services** in the next five years, especially in telemedicine, chronic illness management and self-diagnosis apps.[43]

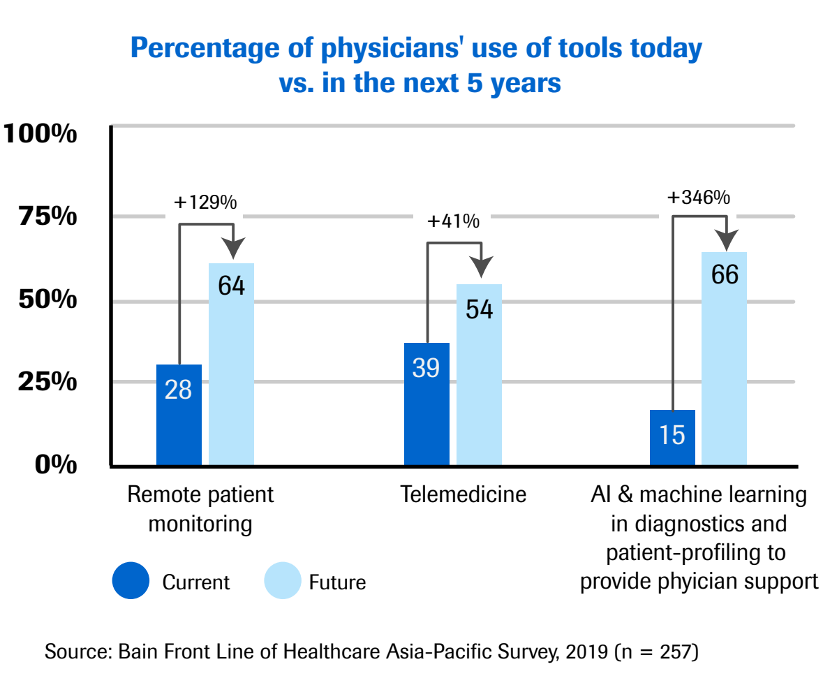
Percentage of consumers' use of digital tools today vs. in the next 5 years



Source: Bain Front Line of Healthcare Asia-Pacific Survey, 2019 (n = 1,823)

In the same survey, a similar **upward trend in digital adoption** is reported among 257 doctors to meet existing unmet needs and improve clinical decision-making and capacity.[43]

Percentage of physicians' use of tools today vs. in the next 5 years



Source: Bain Front Line of Healthcare Asia-Pacific Survey, 2019 (n = 257)

Adoption of technology and innovations can benefit society by bringing better value to patients in healthcare and improving and patient-care readiness

Internet of things (IoT) and digital health adoption is estimated to provide 7-11% cost savings to the healthcare industry, improving value and swiftly increasing healthcare capacity.[44]

The use of telemedicine for home monitoring of chronic diseases in Australia is estimated to save the health system up to USD 2.21 billion (AUD 3 billion).[45] The study on this nationwide telemonitoring initiative also reported:

Over 40% reduction in mortality

36% decrease in hospital admissions

42% reduction in length of stay

IoT and digital health can also improve accessibility and capacity of care in remote areas with poor access to health care services.

The Chinese government has explored the use of telemedicine in rural areas in China to improve healthcare accessibility and capacity. He et al., surveyed the effectiveness of telemedicine in rural Guangdong province and reported.[46]

92.2% Patients' satisfaction rate

89% of all patients desire to revisit

Full and partial compliance of doctor's advice in 52.8% and 35.8% of all patients respectively

Artificial intelligence (AI) enables the analysis and interpretation of large amounts of data to assist HCPs in making better decisions, effective management of patient data information and creation of personalised medicine plans.[47]

A real-world study in India investigated the outcomes of a smartphone-based AI retinal image diagnostic and reported **100% sensitivity and 88.4% specificity** in identifying referable diabetic retinopathy to an ophthalmologist for early management and prevention of blindness.[48]

Similar successes were observed in a nationwide diabetic retinopathy screening programme in Thailand, where AI diagnostics were reported to be more sensitive than human graders in detecting referable diabetic retinopathy (0.97 vs. 0.74, $p < 0.001$).[49]

Prudent use of diagnostics and innovative technologies can improve patient care readiness and VBHC adoption in the Asia Pacific region

Technology's role in healthcare has expanded exponentially over the past 20 years. The shift towards personalisation of care, supported by IoT, digitisation and other innovations of its kind, will be key in delivering value- and outcome-based healthcare. Echoing WHO, adequate investments in diagnostics should be a priority for health systems across the region to ensure that accurate and quality diagnostics are available to HCPs for the development and implementation of strategies to treat, control, and prevent diseases and outbreaks.[9]

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