Above and beyond: Reshaping healthcare after COVID-19

vps healthcare

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1 Executive summary

The purpose of this strategic White Paper entitled, “Above and Beyond: Reshaping Healthcare after COVID-19” is to articulate the Philips-VPS joint vision of the Post COVID-19 new reality, explore potential opportunities in the new landscape, identify solutions and capabilities required to seize these opportunities and recommend a high-level business model to guide the joint way forward.

The COVID-19 pandemic has become the greatest public health challenge we have faced since World War II. Health systems around the world struggled to cope with the overwhelming demand for critical care services, while routine and elective services were suspended to accommodate the rising number of COVID-19 patients. This led to disruption of care for millions and major loss of revenue for providers, compelling them to adopt new ways of working.

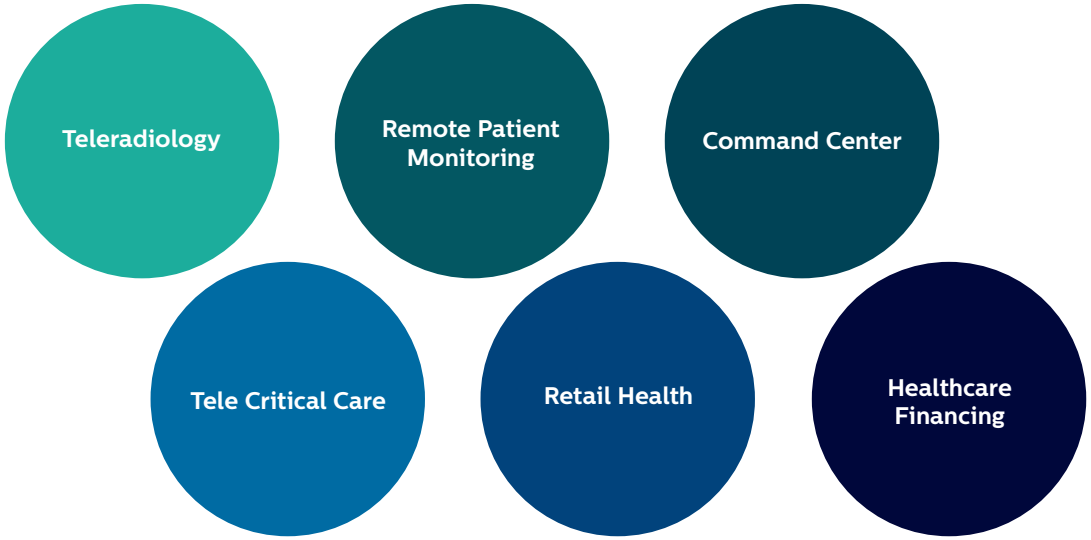
The challenges associated with rapid mobilization of a workforce during the pandemic highlighted the need for flexible, on-demand workforce management. Over-reliance on global supply chains highlighted major gaps in local supply chain infrastructure, while existing business models and contracts that had no inherent flexibility to adapt to change quickly created major challenges to deliver the services that were needed in an emergency. Despite its massive onslaught on the health sector, one positive outcome of the COVID-19 pandemic is the prospect and hope of a much-improved healthcare system for the future.

This White Paper envisions a future driven by five trends

A future where patients receive the care they need when they need it; providers seamlessly deliver care across borders; facilities function seamlessly without physical walls; reimbursement models incentivize value-added services, and supply chains are fully optimized for resilience and speed – an ecosystem that responds to sudden changes with minimal disruption of services. Such a digitized and borderless future landscape provides a perfect backdrop for **Healthcare as a Service** model, allowing multiple parties (like Philips, VPS and others) to co-develop holistic solutions and services that add real value for patients and payers.

With the role of health authorities becoming increasingly more regulatory, their declining interest in upfront investment and direct partnership is providing opportunities for third parties to step in to deliver services to fill the gaps. Such multi-provider partnerships provide the perfect opportunity for players to deliver complementary offerings without duplication, while an à la carte service model could support authorities to avail these offerings to be used when needed, namely during crises.

This White Paper posits **six solutions**, based on our understanding of emerging trends and Philips-VPS core area of expertise, that would lend themselves perfectly to **Healthcare as a Service** model.



Leveraging telehealth, improving supply chains and creating more efficient care ecosystems are among the many lessons of the COVID-19 pandemic. Many of these changes were already underway, but COVID-19 has been the catalyst either by accelerating or course correcting them for more relevant and functional use-cases.

Now is the time to turn those lessons into action and re-imagine, re-engineer, and rebuild our healthcare system to deliver safe, effective, and high-quality affordable care for our patients and communities. We must not waste the opportunity which this crisis presents.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2 Introduction

As the world goes through an unprecedented transformation, one may be wondering what this means for healthcare. Whether shaping new healthcare policies, adjusting hospitals to the new reality, defining innovative insurance plans, or taking care of employees' wellbeing, we are all asking, "What's next?" How can we make our healthcare system so future proof and sustainable that it outlasts any pandemic?

To answer these and many more questions, Philips and VPS Healthcare have jointly developed this strategic White Paper entitled, "Above and Beyond: Reshaping Healthcare After COVID-19". Considering the post-pandemic openness and receptiveness to new and innovative ways of working within the healthcare sector, this represents an opportune moment for different organizations to pool resources and expertise to better explore opportunities.

In this new world, patients will have more information and knowledge about their medical conditions and will be empowered to take an active role in controlling and maintaining their health and wellness. At the same time, patients would have higher expectation from the healthcare providers and would seek services that provide true value by solving their problems.

Combining the know-how of a global healthcare technology solutions provider and a leading hospital group, we discuss why harmony among all healthcare providers is a must for the post-COVID world, and how **Healthcare as a Service** will become the new norm and reshape healthcare delivery.

Disclaimer: This White Paper provides a concept description of the 6 recommended solutions. Availability of these solutions across various markets could vary.

3 Vision and Mission

3.1 Philips

Founded in 1891 in Eindhoven, The Netherlands, Royal Philips is a leading health technology company focused on improving people's health and well-being through meaningful innovation across the health continuum – from healthy living and prevention to diagnosis, treatment and home care.

Philips leverages advanced technology and deep clinical and consumer insights to deliver integrated solutions that address the Quadruple Aim: improved patient experience, better health outcomes, improved staff experience and lower cost of care. Headquartered in the Netherlands, Philips is a world leader in diagnostic imaging, image-guided therapy, patient monitoring and health informatics, as well as in consumer health and home care.

Purpose

To improve people's health and well-being through meaningful innovation, with the aim:

To improve the health and well-being of 2 billion people a year by 2025

To be the best place to work for people who share our passion, promoting personal development, inclusion and diversity

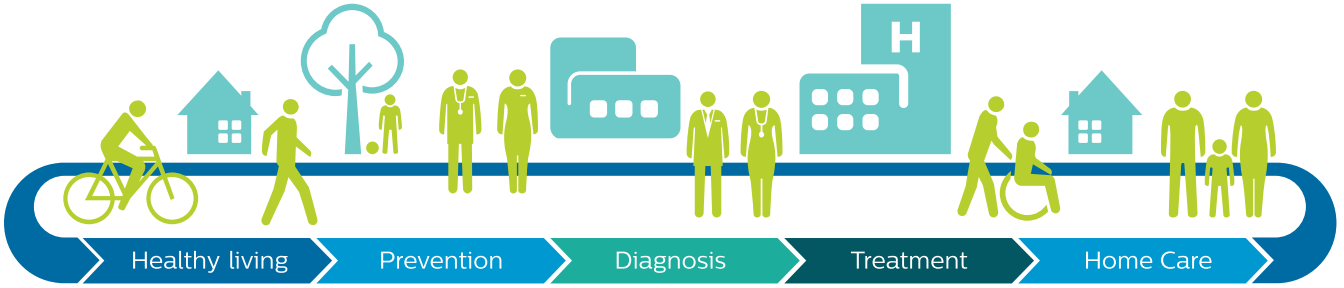
To deliver superior, long-term value to our customers and shareholders, while acting responsibly towards our planet and society, in partnership with our stakeholders

Brand Promise

As a technology company, Philips delivers innovation that matters to you. Philips cares about people. We listen, discover and challenge to deliver meaningful innovation to people with one consistent belief: there's always a way to make life better.

Health Continuum

By addressing healthcare as a 'connected whole' and by seamlessly connecting care across the health continuum, Philips can help unlock gains and efficiencies, drive innovations, improve outcomes and deliver on the 'quadruple aim'.



Quadruple Aim

Philips takes an integrated, systems-view approach that drives meaningful innovation and strives toward the four goals of the Quadruple Aim:

Better health outcomes

Improving the health of individuals and populations

Improved patient experience

Improving the patient experience of care (including quality and satisfaction)

Improved staff experience

Improving the work life of health professionals

Lower cost of care

Reducing the per capita cost of healthcare

3.2 VPS Healthcare

Founded in 2007, VPS Healthcare is an integrated healthcare service provider catering to the needs of around 4 million patients a year. One of the largest healthcare groups in the UAE, VPS Healthcare owns 24 operational hospitals, over 125 medical centers and other allied health support services spread across the UAE, Oman, Saudi Arabia and India.

The healthcare group also owns one of the largest pharmaceutical companies in the Middle East, LIFEPharma, a facility approved by the United States Food and Drug Administration (USFDA). VPS' Response Plus Medical (RPM) is one of the largest on-site healthcare providers in the UAE and possesses a fleet of over 160 ambulances. VPS' Occumed Clinic caters to the medical requirements and check-ups of thousands of workers in the UAE annually. It organizes several medical camps to keep and ensure that the workforce is healthy and fit.

In its 13-year-long journey, VPS Healthcare has earned the trust of the populace of the Middle East and India, making it the operators of choice. VPS Healthcare believes in promoting accessible, affordable and sustainable healthcare to all communities wherever it operates.

During the pandemic, VPS Healthcare was at the forefront and joined hands with the UAE government and health regulatory bodies to contain the spread of the virus in the nation. The healthcare group dedicated its flagship 400-bed medical facility, Burjeel Medical City, to treat COVID-19 patients and set up an RT-PCR laboratory with a capacity to test 5,000 samples daily. The healthcare group also played a pivotal role in fighting the pandemic by supporting the Abu Dhabi government and the Department of Health in conducting the National Screening Program. VPS Healthcare screened over 100,000 people at one of its testing facilities in Musaffah. On the whole, VPS tested over a quarter-million people in the UAE during the period.

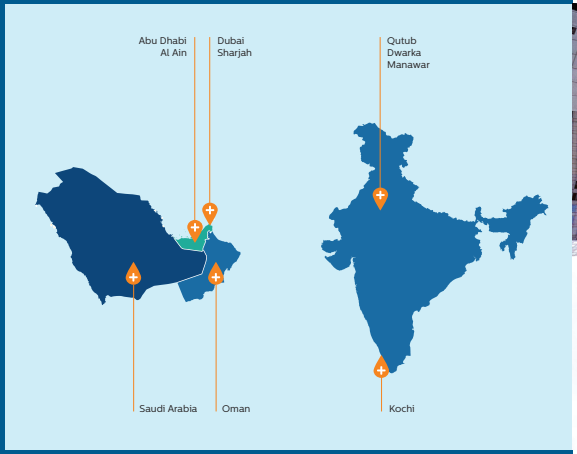
The healthcare group provided the necessary care and solace to COVID-19 patients and treated thousands of people at its facilities. It also managed numerous quarantine facilities and field hospitals and brought in a medical team and medicines from India to strengthen the battle against the pandemic in the UAE.

Vision

To be the preferred and trusted choice in quality healthcare, associate support functions and services, wherever we operate

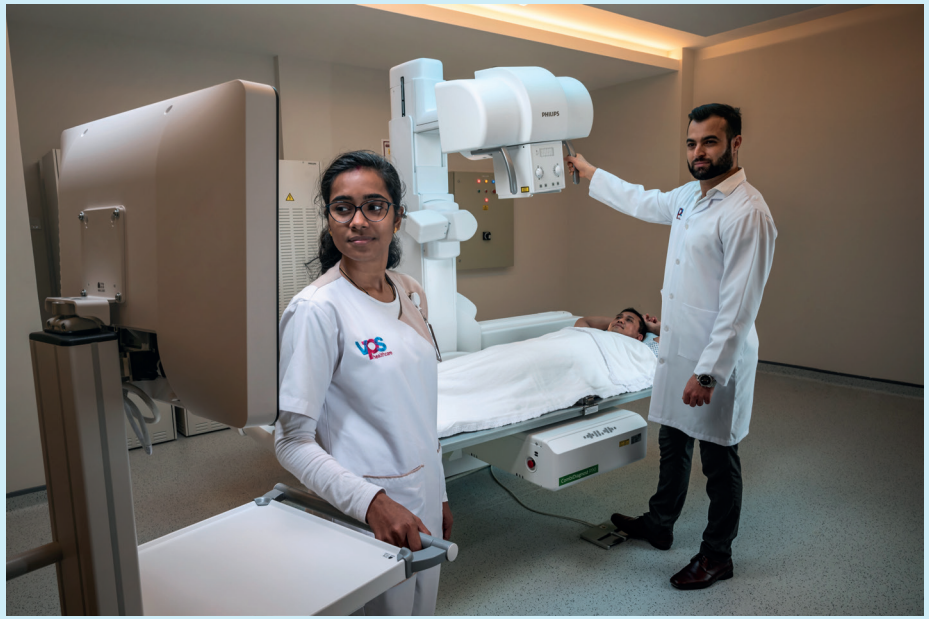
Mission

To achieve world-class corporate governance in healthcare, using technology and the latest medical advances to provide services and outcomes that exceed expectations



Values

- Compassion for our patients
- Teamwork with our staff and partners
- Integrity in our professional conduct
- Responsible corporate citizenship



4 COVID-19 Challenges and Impact

Overview

In December 2019, the Hubei Province in China reported a series of cases where people were affected by pneumonia and respiratory failure. On 11 February 2020, the World Health Organization (WHO) termed this etiological agent as COVID-19 (Coronavirus Disease, 2019).

On March 11, 2020, the WHO declared the coronavirus (COVID-19) outbreak a pandemic. The worst pandemic in a century, COVID-19 has claimed millions of human lives around the world. Presenting the healthcare professionals with extraordinary challenges, COVID-19 also exposed certain fundamental inadequacies and inflexibilities of the global healthcare systems. Furthermore, it has caused massive disruption to economies and societies on a hitherto unprecedented scale.

The COVID-19 pandemic has become the defining global health crisis of our time, and the greatest public health challenge we have faced since the World War II.

Initially, health systems globally were overwhelmed by an extreme surge in demand for critical care services. This warranted significant redistribution of resources from other care areas, e.g. non-critical care clinicians being offered rapid refreshers on critical care and allocated to ICUs and converting general beds to ICU beds. The pandemic highlighted the need for flexible, on-demand workforce planning and management in the future.

As the pandemic unfolded, routine elective services for millions of patients across the world were cancelled or deferred, in order to accommodate the rising number of COVID-19 patients, as well as to avoid cross-infection of non-COVID-19 patients. At the same time, patients also started to avoid visiting hospitals as much as possible. The resultant loss in revenue affected most of the healthcare providers and posed a great challenge to be surmounted.

The pandemic also revealed the limitations in the current reimbursement models that incentivize volume over outcome, and their lack of flexibility in quickly adjusting to the changes in the environment. The limitations prevented providers to adopt new care models such as virtual care, home care and remote diagnosis and monitoring and centralized care coordination.

Additionally, the pandemic caused major disruptions in global supply chains and created

extreme shortages of essential supplies. The pandemic highlighted the need for flexible procurement models and contracting arrangements that would be more adaptable to sudden environmental changes.

In essence, the COVID-19 pandemic created a global health crisis that has changed the way we perceive our world and our everyday lives like never before.

We have in this paper grouped the major challenges and impacts of COVID-19 under 5 categories:

1. Overwhelming demand for critical care services and impact on workforce
2. Disruption of chronic care and elective services
3. Strained supply chain and inflexible procurement models
4. Lack of reimbursement models for out-of-hospital care delivery
5. Lack of regulatory and legislations to address remote care scenarios

4.1 Overwhelming demand for critical care services and impact on workforce

Lack of initial specific epidemiological knowledge about the novel coronavirus, coupled with the incredibly high transmission rates and global unpreparedness, meant the virus rapidly spread across geography and demography. To cope, hospitals ramped up testing efforts, increased general and ICU bed capacity and developed COVID-19 units to isolate and treat hundreds of thousands of infected patients, while safeguarding the health of other patients and hospital staff. The strain was enormous, and health systems struggled to stay afloat – like the Ship of Theseus "that was asked to sail whilst still being built."

At the peak of the pandemic, the number of critical care beds habilitated by intensivists rose up to 300%, creating an unprecedented care and logistical challenge[1]. Intensivists described the management of critical patients with COVID-19 pneumonia as perhaps the greatest challenge faced by intensive care medicine in all its history[2]. In order to increase critical care staffing, health systems around the world held rapid-fire refreshers for non-ED and non-ICU clinicians and reassigned them to work in ED and critical care. The uncertainty in expected patient numbers requiring care, coupled with rapidly changing information about the coronavirus disease, care protocols and related processes, made planning hospital capacity extremely challenging. Additionally, increased biosafety requirements for laboratory examinations, as well as hazardous waste management, added to the overall workload of the hospitals.

The pandemic had extraordinary impact on healthcare workers. Not only did they have to cope with exceptionally high workload at a short notice, but they also had to take extra precautions to avoid contracting the virus. Though the true toll of COVID on health workers is unknown, it is estimated that as of mid-April 2020, more than 9000 healthcare workers contracted the virus in the US and had to be off work[3]. The situation exacerbated with care providers spending considerable time away from direct patient care to maintaining regular communication between the hospital and ambulance services and the paramedics on the pathway of suspected cases, as well as managing COVID-specific call centers.

In addition, shortages in testing supplies, life-saving equipment like ventilators, PPEs, certain drugs and consumables significantly impacted providers' ability to do their 'job' safely and ethically. The huge demand for PPEs made it necessary to rationalize its use, whilst the assignment of other scarce resources resulted in moral distress being added to an already overburdened workforce[4]. The lack of clear guidance from authorities around testing protocols, elective procedure deferral, PPE usage and supply of drugs, etc., created confusion for both healthcare workers as well as the public, resulting in patients coming to hospitals unnecessarily and relying on hospitals for education, thereby adding to the workload of the hospital staff[5].

1. https://doi.org/10.1007/s00134-020-06022-5
2. https://www.medintensiva.org/en-estadisticas-S2173572720301272
3. cdc-report-thousands-health-care-workers-infected
4. WHO-2019-nCov-IPCPPE_use-2020.1-eng.pdf
5. Interestingly, on the other hand, at the peak of the pandemic, people were avoiding or delaying seeking non-COVID-19 related emergency care. In the US, ED visits for stroke and heart attack reduced by 20% (How-ER-are-Adapting-to-Keep-Communities-Safe-during-COVID-19) while in the UK visits to A&E dropped by 57% compared to the year before (how-is-covid-19-changing-the-use-of-emergency-care).

The pandemic highlighted the need for technology-enabled on-demand workforce planning, as well as the need for improved people management programs to best engage and retain on-demand talent. Many retired health professionals also did rapid refreshers and temporarily returned to work to help their colleagues. It also demonstrated the importance of having access to diverse skills and the increasing role of upskilling and reskilling in the future.

4.2 Disruption of chronic care and elective services

As the pandemic unfolded, healthcare organizations redirected resources to accommodate the rising number of COVID-19 patients and suspended non-urgent elective surgeries, procedures, as well as routine outpatient care. Patients also avoided visiting the hospital due to the fear of contracting the virus. This resulted in a 'Secondary Crisis', meaning severe disruption of necessary care for millions of patients across the world and significant financial upheaval for providers due to major loss of revenue.

Disruption in chronic care services

At a country level, 94% of the 155 countries surveyed by WHO in May 2020 had partially or fully reassigned staff from non-communicable diseases to support COVID-19. More than half the countries had their public screening programmes, as well as rehabilitation services, deferred or cancelled.[6] A study of more than 50,000 providers in the US showed that the number of visits to ambulatory practices had declined by 60% by early April compared to last year[7]. People suffering from diabetes, chronic obstructive pulmonary disease, hypertension and mental health were the most impacted groups.[8]

"It will be some time before we know the full extent of the impact of disruptions to healthcare during COVID-19 on people with non-communicable diseases (NCDs) ...Many are unable to access the treatment they need to manage their illnesses."

Dr. Bente Mikkelsen
Director, Non Communicable Diseases, WHO

In addition, it was noticed that there was a significant fall in cancer diagnosis during the peak of COVID-19 infections, e.g. 30% in the Netherlands.[9] Waiting for oncology-related diagnostic procedures and treatments including chemotherapy had put patients at increased risk of adverse outcomes including death.

Data from the UAE and KSA showed that the number of prescriptions had decreased by 8 million, indicating poor medication adherence for many patients, as well as reduced interaction with health providers for new complaints.[10] The impact of postponement of medical screenings and preventive dental care was significant.[11]

The downstream impact of this disruption in routine chronic care will be two fold: Patients are likely to have poorer clinical outcomes caused by late presentations and complications; and providers would suffer financially due to the loss of revenue in the short and long term, as caring for complex patients would be more expensive.

Disruption in elective care

During the pandemic, in a time period of 12 weeks, 28 million elective surgeries were cancelled by 359 hospitals in 71 countries, creating a massive backlog. It would take at least 45 weeks to clear this backlog, only if the hospitals increased the volume of surgeries by 20 percent. Globally, 70 percent of total surgeries were cancelled during the period. While 81.7% of benign surgery, 37.7% of cancer surgery, and 25.4% of elective caesarean sections were likely to have been cancelled or postponed.[12]

Cancellation or delaying of time-sensitive major procedures like gastric sleeves, heart valve replacements and oncological surgeries are likely to lead to deteriorating health, worsening quality of life, and unnecessary deaths. Even when the recovery begins, it could be accompanied by a resurgence of demand for both elective and delayed essential procedures, straining business models and financial resilience.

At the peak of the pandemic, an estimated 50% of the regular care in the GCC was on hold. An estimated 8 million patient contacts were cancelled every week, and 400,000 doctors, nurses, dentists, allied

6. significantly-impacts-health-services-for-noncommunicable-diseases
7. http://www.allhealthpolicy.org/wp-content/uploads/2020/05/ES-AHP-Covid-Primary-Care-webinar-FINAL.pdf
8. 10.1016/j.dsx.2020.06.042
9. https://www.iknl.nl/covid-19
10. watershed-moment-gcc-healthcare-industry
11. health-care-during-covid-canceled(health-care-during-covid-canceled

health and other care professionals were not able to practice medicine. Most elective surgeries were postponed, visits to the family physician or dentist were cancelled, and many mentally ill or disabled people received less support. Without appropriate infrastructure outside the hospital including home care in the GCC countries, a huge volume of patients who needed help couldn't access the care they need.

4.3 Strained supply chain and inflexible procurement models

Common natural disasters (such as a hurricane) occur in one region, country or area of a country. In such situations, supply chains could redirect resources from one geography to another and/or increase production. However, dealing with the COVID-19 pandemic was more challenging, because of the sheer nature of an unseen enemy virus that rapidly spread around the world in short order, putting massive strain on resources. It wasn't a mere spike in demand or a single supplier that has been taken offline. It was and still is a global phenomenon, now exacerbated by regulatory restrictions in production, exporting, and manufacturing. The resultant disruptions to the supply chain have had significant consequences.

In the short term, some providers didn't initially experience the full impact of the supply chain disruption by virtue of substantial pipeline inventory (created by long supply chains), batch manufacturing, large-scale production and a few months' worth of stockpiled inventory. However, once this was depleted, widespread shortages followed. Providers across the care settings fought the virus with whatever minimal resources available, and at times without the ideal equipment, putting the healthcare workers and patients at risk.

The COVID-19 pandemic revealed the vulnerability of the supply chain to global shocks that no one had at that point anticipated or even thought possible. It affected the supply chains in such an unprecedented manner that not only created extreme shortages of essential items, but also exposed the risks inherent in the existing system of global supply chains. Our relentless efforts to achieve supply chain optimization to minimize costs, reduce inventories, and drive up asset utilization removed buffers and flexibility that could absorb disruptions. The just-in-time inventory practices employed throughout the distribution system meant there was very little excess supply or redundancy built in.

In general, healthcare requires five categories of products: pharmaceuticals, personal protective equipment, medical devices, medical supplies, and blood products. Each of these categories has a distinct supply chain, and the failure of any one of these chains can obviously wreak havoc on the healthcare system.

PPE

With limited global manufacturing capacity, it took a few months for the manufacturers to meet the increased demand. In addition, all providers were competing for the same resources and paying a significant premium over list price, thanks to unscrupulous business practices. With the traditional supply chain unable to fill the gap between production and consumption, many hospitals had to source directly. Direct sourcing is a new approach to most hospitals, because they have historically relied on distributors and group purchasing organizations to manage many aspects of the sourcing process. Given the large number of new PPE manufacturers entering the market, the sourcing process (which involves supplier identifying, vetting/certification and establishing transaction systems) has proven to be highly burdensome, consuming too many resources.

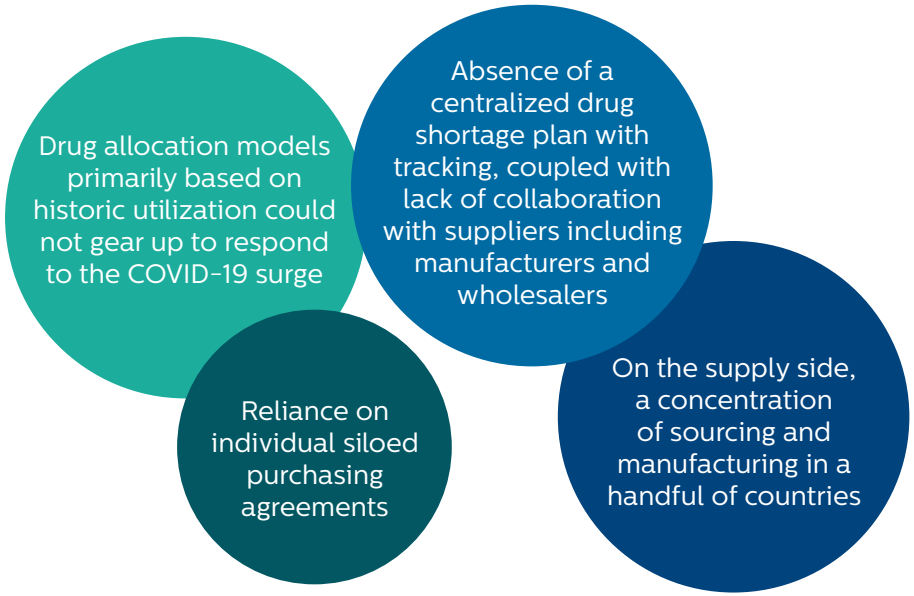
Medical supplies and devices

Medical devices have highly regulated supply chains, in order to ensure that product functionality, reliability, and quality standards are met. However, this keeps prices very high, whilst at the same time, high entry barriers stifle competition, innovation, and commoditization. This is a double whammy; low production capacity hampers the approved manufacturers' ability to supply, whilst at the same time, no one else can. Moreover, the fluidity of the pandemic makes accurate demand forecasting difficult, and lack of standardization across brands exacerbates this problem. As devices such as ventilators require specially manufactured components, scaling up capacity is difficult. It is also crucial to remember that user interfaces differ across ventilators. Acclimatizing to different ventilators places an unnecessary burden on healthcare professionals, wresting valuable time and energy from patient care. Moreover, switching ventilators for successive patients may result in avoidable inefficiencies.

12. bjssjournals.onlinelibrary.wiley

Pharmaceuticals

COVID-19 highlighted the following limitations of the current drug supply chain:



4.4 Lack of reimbursement models for out-of-hospital care delivery

The current healthcare reimbursement models are predominantly driven by in-hospital, face-to-face care delivery. This created a seemingly paradoxical scenario for the finances of healthcare providers, as the coronavirus pandemic unfolded. As providers suspended elective services and redirected resources to care for the rising numbers of COVID-19 patients, normal revenue streams driven by face to-face care almost dried up. The drop in revenue was further worsened, as social distancing protocols limited the number of patients in an ambulatory setting, and patients started avoiding hospitals for the fear of contracting the virus.

As the crisis necessitated the rapid acceleration of virtual care and care at home adoption and development, the inadequacy of a reimbursement model primarily based on in-person, face-to face care delivery became more apparent. It also highlighted the limitations of reimbursement models driven by throughput (the number of tests, procedures and visits, etc.), rather than value-add e.g. a fee-for-service model.[13] This rekindled the long-standing argument that such 'fee-for-service' financing model provided limited provisions for incentivizing outcomes and allowed inefficiency, by perversely incentivizing providers to do more than might strictly be necessary in order to increase revenue. The impact was compounded in the Middle East region, where the current setup of healthcare systems is based on Diagnosis Related Group (DRG) concepts, prioritized reimbursements of expensive interventions instead of more cost-effective solutions actions such as preventive care, behavioral health services, disease management and addressing social determinants of health. This led to providers facing a major dilemma. Though virtual care and home care could lower costs of care and improve patient engagement and outcomes, these same efforts lead to reduced revenue under the current prevailing DRG fee-for-service reimbursement scheme. Some of the countries in the Middle East region have already adopted the value-based care model; a step in the right direction, though still in the initial stage.

The pandemic created enormous unbudgeted expenditure. As we move forward, it is likely that the payers would put more onus on the providers of managing patients more effectively and efficiently in order to control costs. This is likely to be more pronounced in the Gulf Cooperation Council (GCC) countries, owing to their mandatory insurance-driven reimbursement model. In addition, with an aging population and rising incidence of chronic health conditions in the GCC, the pandemic has forced providers to increase their focus on three fronts for out-of-hospital care delivery – prevention and wellness, remote care and monitoring and post-acute care – in a step-down manner to ensure monitored recovery in cheaper settings.

In essence, the global trauma inflicted by COVID-19 gives policymakers a mandate to break the pre-crisis status quo and pursue deep change based on the new reality. By demonstrating the limitations of the current models and in allowing for alternative models of care, the pandemic has created political visibility and public support for improvements in health financing. This could be harnessed to drive ambitious and long-needed reforms that create clear accountabilities, optimize outcomes, empower patients and enhance health financing resilience and sustainability.

13. https://www.shvs.org/is-covid-19-the-end-of-fee-for-service-payment/

4.5 Lack of regulatory and legislations to address remote care scenarios

There was a sudden and urgent need for regulatory legislations to define and control out-of-hospital care delivery. Healthcare providers were facing situations in which more focus was required on remote patient assessment with no physical physician-patient contact, for which technology was heavily relied upon to bridge the gap and allow virtual implementation of healthcare as much as possible. Neither healthcare providers nor patients were ready for this evolving way of care. The physicians' undergraduate training on digital technology was not part of medical school curriculums, and the patients' acceptance was variable and more reliant on personal preference.

Healthcare regulators responded to rapidly changing situations and produced guidelines which were regularly updated to catch up with the evolving knowledge of the disease. Likewise, by and large existing medico-legal regulations were not generally framed to anticipate and take into account for scenarios where geographical boundaries were crossed, and the care was spread across countries with different medical and legal legislations.
The lessons from the COVID-19 pandemic call into action the need for a fresh look into this area and have us better prepared for any similar eventuality in the future.

5 Vision of the Above and Beyond: Reshaping Healthcare after COVID-19

Overview

"The crisis is a catalyst for change in the healthcare system... now, because of corona, we see the limitations of the traditional system"

Frans van Houten
CEO, Royal Philips

COVID-19 has become a trigger for change – a defining moment for all of us to reimagine healthcare. Despite its massive onslaught on the health sector, one positive outcome of the pandemic could be the prospect and hope of a much-improved healthcare system for the future.

This White Paper envisions a future where patient-centric, value-based healthcare systems are powered by a digitally connected ecosystem with an increasing presence of virtual care. Here, patients receive the care they need when they need it without exhausting existing resources; providers seamlessly deliver care across borders; facilities smoothly function without physical walls; reimbursement models effectively incentivize value-added services; and supply chains are fully optimized for resilience and speed. We see such systems to have an inherently flexible infrastructure to promptly respond to sudden changes in the environment, e.g. another major public health crisis, with minimal disruption of routine services.

The new world will be driven by advanced data analytics, interoperable systems, standardization and platform thinking – all of which will work to put the patient at the center of care delivery process. Patients empowered by knowledge and digital technology will take more control of their health and wellbeing, as the system will focus more on 'proactive wellness care' than 'reactive sick care'. We see an increasing alignment in incentives for providers, payers and regulators, and more collective and integrated efforts to achieve the greater good.

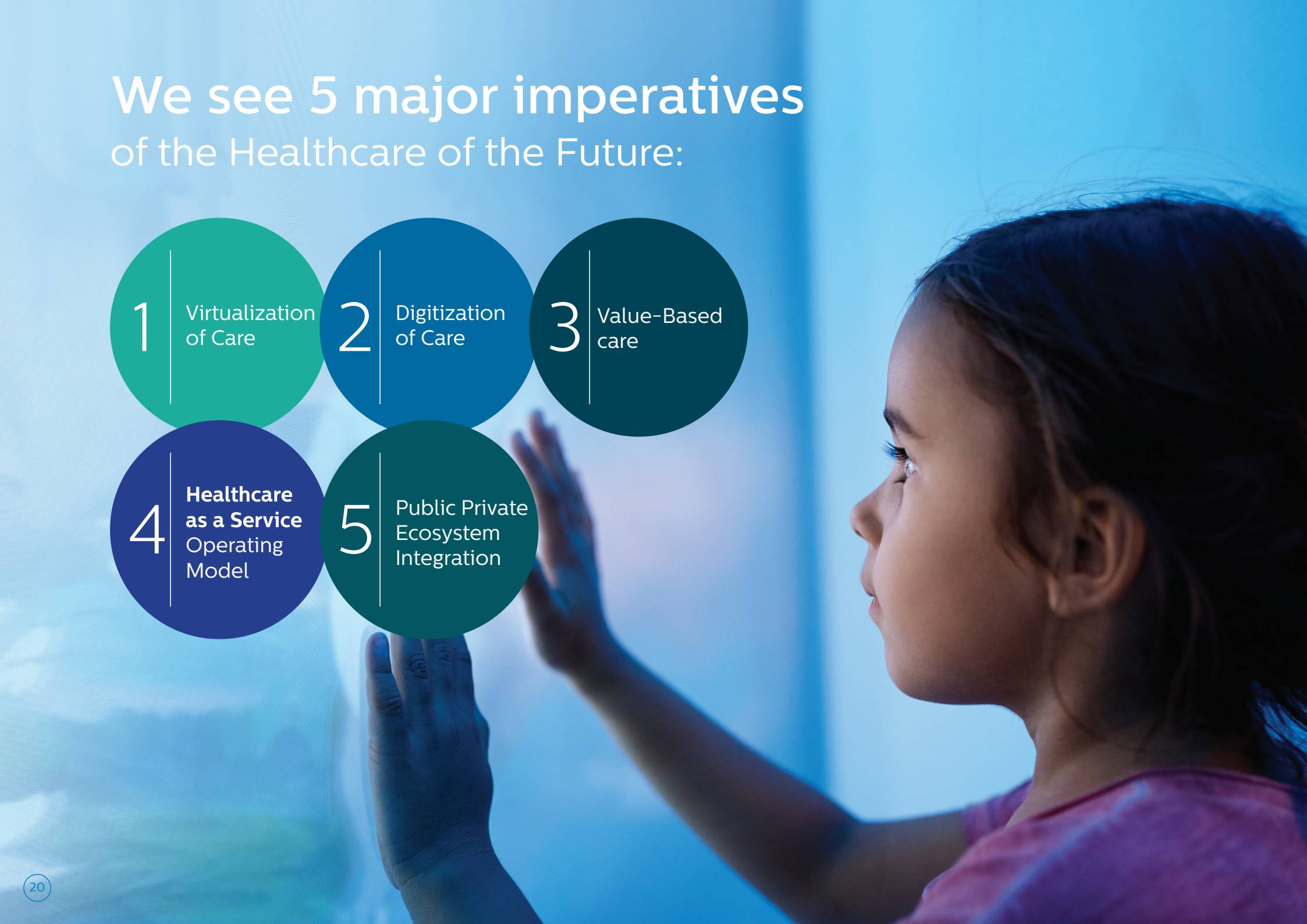
The pandemic has induced rapid and dramatic changes in the care delivery system. It demonstrated the innate ability of the healthcare system to adapt to major and sudden disruptions and innovate itself. This experience should embolden policy makers to pursue new directions and initiate policies that were previously perceived as unviable.

"We are seeing the future of healthcare, and how agile innovation can make things work"

Jeroen Tas
Chief Innovation & Strategy Officer, Philips

We see 5 major imperatives
of the Healthcare of the Future:

1. Virtualization of Care
2. Digitization of Care
3. Value-Based care
4. **Healthcare as a Service** Operating Model
5. Public Private Ecosystem Integration



5.1 Virtualization of Care

Although virtual healthcare[14] has been around for the last 10-15 years, its adoption (virtualization of care) remains limited. A 2019 consumer and provider survey revealed that pre-COVID, fewer than 1 in 4 internal/family physicians provided video visits, while fewer than 1 in 10 consumers used telehealth[15]. However, COVID-19 has changed that by making it a necessity for us to find ways to deliver care without face-to-face contact, as necessitated by social distancing and isolation requirements. We see telehealth is all set to becoming the 'table stakes' for providers and their widespread adoption by patients.

Change in provider perception and attitude

The extensive use of telehealth during the pandemic has triggered a cultural shift in providers' attitudes towards virtual care as the preferred way and one of the safest ways for interacting with patients. They also witnessed how virtualization could improve their efficiency and effectiveness, by freeing up time and resources for more essential roles that require face-to-face care. A study published in the Journal of the American Informatics Association revealed that between March 2 and April 14, virtual urgent care visits grew by 683%, and non-urgent virtual-care visits grew by a staggering 4,345%.[16] Another study showed that 57% of providers viewed telehealth more favorably than they did before COVID-19.[17]

Going forward, virtual consultations will allow providers to allocate resources based on the needs of the patient, thereby enabling them to see more patients quickly and efficiently. Leveraging virtualization, they will be able to focus on those who need urgent support, whilst advanced medical analytics predictive algorithms/artificial intelligence (AI) will forewarn about potential issues for proactive action. We also see increased focus on strengthening of primary care, screening, prevention and health promotion services, along with the establishment of specialized day care and diagnostic centers. This will lead to the

14. Virtual health is more than just virtual visits. It refers to interactive, electronic exchange of information for diagnosis, intervention, or care management as well as different modalities or channels of communication, and different endpoints, both patient-to-provider and provider-to-provider (How COVID-19 is transforming telehealth—now and in the future. Insight from telehealth's tipping point. Health Care IT Advisor, Advisory Board, 2019).
15. Amwell, Telehealth Index: 2019 Consumer Survey; Amwell, Telehealth Index: 2019 Physician Survey
16. https://www.healthcareitnews.com/news/telehealth-set-tsunami-growth-says-frost-sullivan
17. The Rapid Transition to Telemedicine: Insights and Early Trends," Press Ganey, May 2020

development of new virtual care pathways. That being said, the shift to virtual care will create a capacity vacuum at many routine ambulatory sites of care, as organizations may choose to reduce their square footage footprint.

Even with physician practices reopening for routine services, strategy leaders estimate that as much as half of the demand for physician interactions is likely to remain virtual. It is estimated that in the United States, the number of telehealth visits is expected to reach up to 1 billion in 2020[18]. Providers will re-evaluate conclusions about consumer perceptions of convenience—radius of consumer to physical outpatient location will no longer be the primary metric for network development.

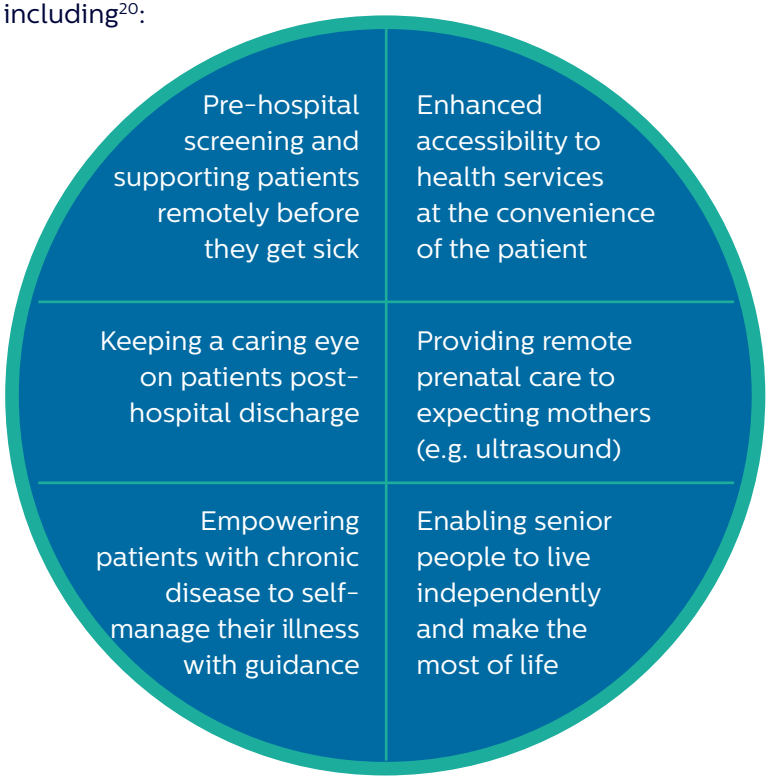
Change in patient perception and attitude

The pandemic has also changed the patient's attitude to accessing healthcare services. With social distancing here to stay, patients will be reluctant to go to a brick and mortar clinic, fearing the risk of been infected. A large-scale study, conducted by Press Ganey on people availing telemedicine during the early days of the pandemic, found that patient experience during virtual visits achieved similar ratings as in the case of in-person visits.[19]

Expansion of home care

With increasing virtualization, the patient's home will increasingly become a preferred and legitimate care setting. More and more patients could be using sensors and wearables and being remotely monitored and managed in the comfort of their homes.

We see that care will move to the patient's home in various ways including[20]:



18. Healthcare Predictions 2020: Virtual Care Visits Will Soar To More Than 1 Billion In The US, Forrester Research, March 16, 2020
19. telemedicine-report-revealing-new-consumer-insights
20. six-ways-healthcare-move-our-homes-henk-van-houten

"The hospital room of the future will be the bedroom," cardiologist Eric Topol wrote in 2015, foretelling a world in which monitoring of vital signs and other relevant physiological metrics would shift from the hospital to the home for all but the most acutely ill patients[21]. Five years later, this prediction seems ever more prescient – in ways that few of us could have imagined just a few months ago."

Henk van Houten
CTO, Royal Philips

Change in acute and critical care

Virtualization will also play an increasingly important role in acute and critical care settings within the hospital. Contactless monitoring solutions (wearable sensors) will be used to provide critical care outside of the physical walls of the ICU and will greatly faciliate increasing critical care capacity at short notice, e.g. a future pandemic.

Remote diagnostic technologies will broadcast non-traditional monitoring elements, such as ultrasound or assistance with a laryngoscopy, to augment bedside care. Advancements in Emergency Care Resuscitation technologies will transform pre-hospital care by empowering community paramedicine to provide care at the patient's home (even before an emergency episode occurs), facilitate onward care and may even avoid admission.

Potential challenges

Before the pandemic, a number of factors have contributed to slow adoption of telemedicine, including a lack of digital infrastructure, business incentives, regulatory frameworks and policies and usable affordable technology, not to mention the cybersecurity threats to the systems and data. The biggest challenge today is building a smart digital infrastructure framework. In addition, we must be cognizant of the 'digital divide' that could worsen the existing health inequities with disadvantaged and marginalized groups often lacking access to technology to avail remote consultations. Another challenge is the lack of human touch; there is a lot to be said for human touch in healing. How can we emulate touch without touching? How do we balance technology with empathy? How do we ensure that we correctly align technology with healthcare in society?

Conclusion

In conclusion, we are at a point in time now where there is no turning back from telehealth, that the seismic shift to telemedicine has taken place. It's no longer an alternative, it is the 'care of choice'. Telemedicine is here to stay. The COVID-19 pandemic has been the "sentinel moment for the expansion of telemedicine." That being said, there will still be a need and place for traditional in-person ambulatory patient visits. However, brick and mortar clinics will also see increasing transformations, for example touchless check-in, drone deliveries, social distancing restrictions and many other precautions, that will change current processes.

21. Topol, E. The patient will see you now: the future of medicine is in your hands. 2015.

5.2 Digitization of Care

The future of healthcare is likely to be characterized by a digitally connected ecosystem that will focus on health and wellness and will facilitate integrated care delivery across providers and/or care settings. Patients and providers will work in close partnerships enabled by technology to meaningfully and proactively connect with each other that will have a transformational impact on care delivery and quality. We see digital health emerging as a priority for healthcare systems to drive value, accessibility, equity and high performance.[22]

Digitized health continuum

On one end of the spectrum, healthcare ecosystems will emerge to address the needs of healthy patients, who have less consistent medical challenges, but often set personal wellness goals. On this side of the spectrum, the experience will be much more digital, with the patient supplying data, and insights being provided by clinicians, in a highly personalized and meaningful virtual interaction.

On the other end of the spectrum, healthcare ecosystems will emerge to address the needs of patients who have multiple complex chronic conditions and will need more direct virtual care (consultations) and ultimate in-person care. Technology components of these ecosystems will often be leveraged to enhance the in-person experience and support the care team.

During a pandemic, such an ecosystem would enable the national command center to manage and attempt to contain the outbreak more effectively. In normal times, such an ecosystem would foster exchange of best practices and raise the standard of care, while improving efficiency and effectiveness of scarce resources.

Emerging trends

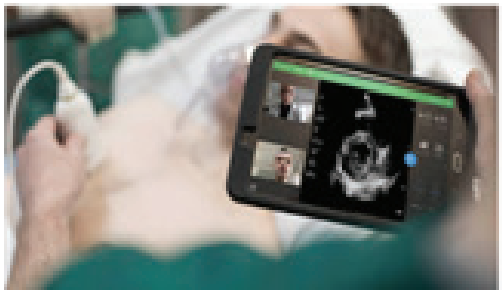
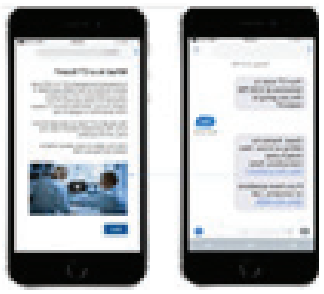
Going forward, connected care informatics will play an increasingly important role in assisting providers with confident decision making, and we anticipate major investment in this space. Presented below are the major trends that are likely to shape the digital future:

1. Solutions/Applications

Person-enabled healthcare

Individuals will provide real-time data through wearables. This will place the individual at the center of health and wellness care and prioritize healthcare services, that support people and populations to manage their health and wellness within the context of their personal values, needs, and unique life circumstances. Only a small percentage of patient interactions or touchpoints would be in the form of traditional in-person care and even then, the connectedness would enhance the interaction by supporting the care team. Technology-enabled care coordination between providers and services, delivered virtually or in-person at or near the home, will be critical to a positive end-to-end experience.



22. HIMSS Digital Health Framework. https://www.himssanalytics.org/DHI

2. Cloud-Based Healthcare Delivery

i. Hub and Spoke

Organizations are likely to consolidate certain clinical and operational/managerial activities in central e-hubs (care orchestration platforms) to gain more efficiency through seamless end-to-end care delivery, increased throughput, faster response time and optimal use of expertise.

a. Clinical uses - telehealth could facilitate physician-to-physician connection, in order to centralize some practices and help departments become more efficient with reduced need for specialists. Another example could be Tele ICU where intensivists could remotely oversee hundreds of ICU beds to help deal with issues, such as lack of sufficient critical care staff, the need to quickly increase ICU capacity or allow treatment without in-person contact between patients and providers. Upon discharge, the hub must ensure that early warning signs are identified and acted upon to avoid preventable readmissions. The hub could play an important role in defining whether the patient is fit to be discharged home or to a step-down facility.

b. Managerial uses - centralize admission process to determine where a given patient should be admitted, be it post emergency room visit or post elective procedure. Another example could be centralizing scheduling for surgery to ensure availability of ICU beds post operation. This allows capacity management to be done at department level by bringing better insights from the centralized workflows to optimize the patient journey.

ii. Standardization

It will avoid wasting time and resources caused by having to do data transfer customizations. This is critical for a quick scaling up of business and clinical processes. In the new digitized world, without standardization, it would be much more difficult to share information across providers and integrate the care process. That said, it is important to build in some variation capacity in the standardization models to allow for some flexibility when required. Thus, a balance needs to be struck between customization and standardization, such that care is personalized within a standardized care environment as much as possible. From our experience, major players veer more towards standardization vs. smaller players who have the ability to almost over-customize solutions.

iii. Modular/Platform Concept

The focus is shifting from expensive and time consuming large-scale 'big bang' implementation of large systems to modules that are suitable for platform adoption which can be scaled up faster. This allows step-by-step adoption of successive modules and breathing space for organizations to get one module right before moving onto the next. Examples include EMR, HR, financial systems modules etc., contained within one platform.

3. Enabling Foundational Capabilities

i. Predictive analysis

Future systems through predictive analytics will become what could be called “learning” healthcare systems, whereby robust analytics track health outcomes to enable systems to learn and define the care delivery strategies that achieve best outcomes for every individual and population, and the conditions under which they occur. For example, enabling advance warning of changes in patient acuity, so that appropriate intervention(s) could be put in place in order to prevent adverse events/complications. There will be increasing emphasis on intelligent monitoring across the enterprise, as well as connecting pre and post-hospital care. For predictive algorithm to be effective, there is a need for advancing technologies and open ecosystems sharing data originating from many sources to get the full picture real-time. The AI-powered monitoring solutions with prescriptive algorithms would specify and outline what a clinician needs to do, contrary to predictive algorithms which would provide information about trends and are expected to be a real ‘game changer’ in the new digitized world.

ii. Interoperability

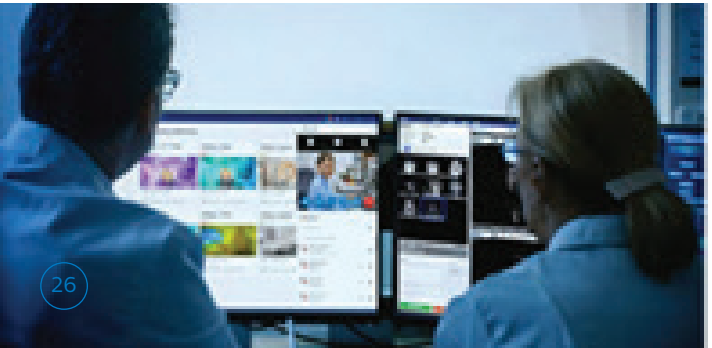
An integrated data backbone that allows data flow and sharing of information across the system is critical to supporting the care process, where different actions are being taken at different points across the care continuum. Equally important is to determine what data is needed, acquiring and qualifying the data and extracting meaning from the data. Without open communication between systems, the power of data cannot be unlocked. Whilst waiting for the panacea of standardization, interoperability remains crucially important.

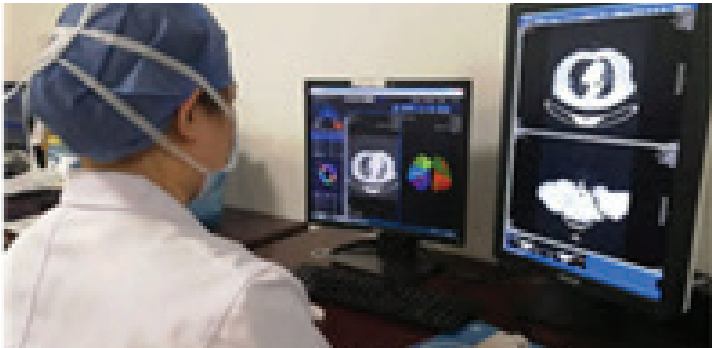
iii. Data security

Medical devices are increasingly interconnected and online. Balancing their cybersecurity with the need to stay digitally integrated is a critical focus. We see greater cloud adoption, as it is more controlled and thus more conducive to ensuring data security. In addition, the technology required for the accepted level of security is currently very expensive, as massive amounts of data need to be shared across many systems and require careful management. We also see increasing interest from the governmental authorities in health data cloud to facilitate population health management initiatives.

Conclusion

In conclusion, we are likely to see rapid acceleration of digital care in the coming months and years, and we envision a digitized future where the empowered patient will be directing and driving their own care by connecting to their providers at anywhere, from anytime. Providers will in turn adopt cloud based healthcare delivery models that will allow standardization of information, central coordination to address sudden changes in demand and capacity, and real-time virtual collaboration and modular deployment of services as suited to meet their unique needs. Health systems will be powered by intuitive capabilities, for example advanced medical analytics and predictive algorithms/ artificial intelligence for turning data into fast and meaningful insights, interoperable systems for sharing information, and robust mechanisms for protecting the privacy, security and safety of patient information.





5.3 Value-Based Care

COVID-19 has forced the healthcare community in the Middle East to collaborate, in order to transition away from siloed and wasteful care delivery to a more patient-centric and productive healthcare landscape. In this new landscape, we see increasing adoption of Value-Based Care (VBC) as being at the center of patient-centric future healthcare systems, where the 'value' is measured as health outcomes against the cost of delivering these outcomes. VBC will incentivize providers to deliver services contributing to outcomes that matter to patients.

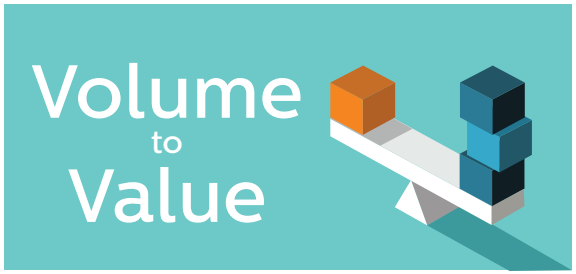
Within a VBC environment, the providers will be rewarded for proactively engaging with patients, empowering them to improve their health, reduce the effects and incidence of chronic disease, and live healthier lives in an evidence-based way. This in turn will improve outcomes and efficiency by reducing the downstream impact of avoidable complications requiring expensive interventions. In addition, this approach will facilitate better conditions for anticipating, minimizing and managing unexpected demand for health services and resources.

That being said, in the short term, providers are likely to focus on recovering the revenue lost from the hiatus in elective services created by the pandemic. Therefore, they could be more risk-averse and reluctant to pursue risk-based contracts with payers and rely on fee for service payment. In the longer term, however, the focus is likely to be on chronic diseases management, facilitated by effective primary care, telehealth, remote patient monitoring and digital health education. These are exactly the aspects that need to be accelerated to make VBC a reality.[23]

"The future of value-based care can be even brighter than before the crisis. With strong value-based, population health management networks, providers become more resilient and more adaptable to potential future crises."

Jan Kimpen
Chief Medical Officer, Philips

Ruben Osnabrugge
Global Strategic Program Lead
Value-based care, Philips



23. innovation-matters/2020/20200630-moving-towards-value-based-care-will-covid-19-accelerate-or-slow-down-transformation.html

Essential building blocks of VBC

1. Outcomes measurement – Establishment of well-defined, standardized outcomes, and the use of common protocols for measuring performance to identify and eliminate variance are fundamental to VBC. Going forward, there will be more emphasis on measuring Patient Reported Outcome Measures (PROMS) and Patient Reported Experience Measures (PREMS) and the use of universal standards, e.g. International Consortium for Health Outcomes Measurement (ICHOM).

2. Open data standards - Interoperable and secure data platforms, facilitating transparent capture and reporting of data between systems, processes and stakeholders, are paramount.

3. Reimbursement reform - Shared risk and aligned incentives across care pathways and providers

Potential challenges

Implementing VBC programs is not a straightforward task. There are many challenges to overcome which require careful consideration, planning and management. Organizational limitations, financing and regulation of healthcare systems and the lack of alignment of incentives are some of the barriers faced when shifting to VBC. In addition, implementing VBC is a technically and administratively complex process requiring interoperable systems, and automated data collection along the care pathway for measuring meaningful outcomes. VBC programs that currently exist are being introduced incrementally, but the overall pace of adoption is slow. In a recent survey, held with 364 hospital executives across the US, only a third of respondents said they were currently participating in some form of value-based model.[24]

Conclusion

In summary, moving to a reimbursement model that incentivizes overall value generation, rather than the provision of individual services, would lead to more patients getting the right care in the appropriate setting, thereby improving quality while reducing costs. While the establishment of such a healthcare system in the Middle East (including the introduction of payment models to incentivize value-based care) is likely to be a long and complex journey, multi-party collaborations (e.g. health authorities, technology / solutions providers, clinical operators, insurers, investors etc.) could pave the way for a new future of healthcare.

This paper recommends the application of Health Maintenance Organization (HMO) financing model, that incentivizes alternative models of care, value creation and risk-sharing between providers and payers, to optimize outcomes at a reduced cost (see section 6.6).

24. transforming-healthcare/
25. This was evidenced in the following survey by providers in value-based contracts vs those in fee-for-service arrangement (providers-in-apms-had-head-start-with-managing-covid-19-surge). Of the two groups involved, 82% of the first group implemented care coordination, used population health data analytics to manage and predict COVID-19 case, conducted remote monitoring and other value-adding capabilities during the pandemic as opposed to 51% of the second group.

5.4 **Healthcare as a Service** (HAAS) Operating Model

Overview of the HAAS model

On-demand, anytime, anywhere healthcare services powered by digital technologies are disrupting healthcare providers' traditional value propositions and giving rise to new operating models[25].

This section describes an innovative use of the traditional business-to-business (B2B) operating model, specifically suited to cater for the post COVID-19 needs of the health sector, called **Healthcare as a Service** or HAAS operating model.

As opposed to a more common business-to-consumer (B2C) model where care is delivered by the provider directly to the patient, in this HAAS model, the provider offers one or more new technology-driven health services to another provider, who then offers it to their own patients. These healthcare services could be clinical or non-clinical or a combination.

The HAAS model has its foundation in the 'modular concept' where services are regarded as 'modules' or 'platforms'. This allows the provider to purchase exactly what is needed to suit their priority and affordability. It also allows the service developer to add new modules, as they become available without any impact on the already purchased services. Such modular 'plug n play' model enables faster collaboration between the parties. In addition, the learnings from one module could be used for subsequent modules to refine the process and realize optimal benefits.

It is recommended that within a HAAS operating model, services or modules be purchased on a subscription or on consumption basis. That would allow the purchaser to cost-effectively expand the reach and accessibility of care. It would also enable the service owner to get more return on their current investments in applications, facilities and expertise. However, other models, e.g. a capital-based model with a set rate per bed per year or a risk sharing model, could also be applicable.

25. https://www.cognizant.com/perspectives/new-provider-business-models-for-healthcare-on-demand

Why is HAAS suitable for the post COVID new normal?

As the post COVID-19 new normal sets in, health consumers empowered by digital technology will be expecting more and more on-demand, anytime, anywhere service that would keep them well. There is likely to be a group of providers, both public and private, who might find it cost-prohibitive to do a major overhaul of their current systems in order to be able to match these emerging needs. Thus, they might be open to purchasing 'ready-made solutions', which in an effective and efficient manner, would address the health needs of the populations they serve. This could present a potential opportunity for introducing a HAAS operating model, where providers with the right expertise, capabilities and resources develop those solutions and become the aggregators of services, which other providers could select and access on demand for a fee. With the rise in virtual and digitized care provision, the marketplace is now borderless, spanning across geographies and demographics, meaning opportunities are potentially huge.

We envisage these solutions to be driven by multi-vendor partnerships, where providers with complementing strengths and expertise would join forces to collectively create 'services' that might not have been possible had they been operating in isolation.

"COVID-19 has exposed the limitations of the present healthcare system. Learning from the present crises, we must reinvent and build a robust healthcare ecosystem that would cater to the needs of all the populations in the future. Healthcare as a Service is an ideal model to be adopted, as it would armor the ecosystem around the world against any likely health threats, such as the present pandemic."

Dr. Shamsheer Vayalil
Chairman and Managing Director, VPS Healthcare

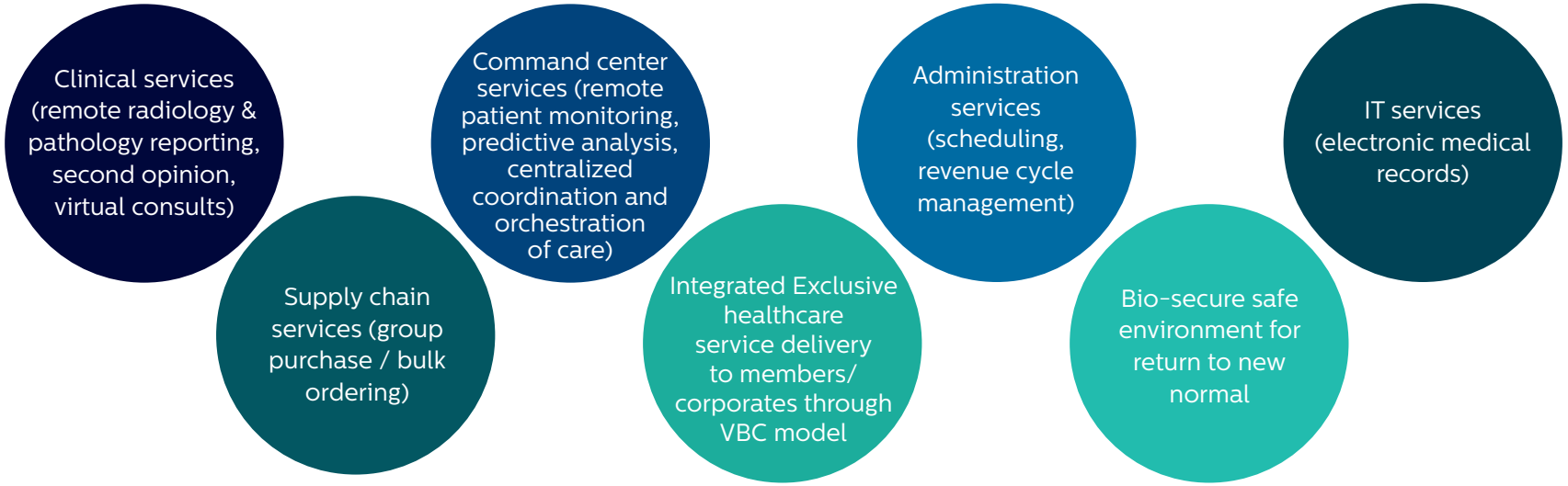
Success factors for HAAS partnership

The parties entering a HAAS partnership could become major operators within the health sector by bringing together transformative ideas, deep clinical expertise, speed and agility, and cultures of innovation, competitiveness and price transparency under a single umbrella. We see the following factors being critical for a successful partnership.

The Philips and VPS HAAS model

We envision a future where clinical providers (i.e. VPS) and technology providers (i.e. Philips) collaborate to identify the new post COVID-19 needs of healthcare providers, jointly create unique value propositions to match those needs, and position themselves optimally to capture the potential B2B opportunities through a HAAS operating model as described above.

We foresee the emergence of new asset light, operational expense-driven (as opposed to capital-driven) HAAS models that would allow more flexibility and expanded service provision. A range of public and private sector organizations within and outside of the health sector could be the potential customers of these à la carte services, which could include a broad range of clinical and non-clinical functions including:



In this borderless, digitized future landscape, the UAE with its unique position between Africa, India and Asia is perfectly poised as a strategic launch pad for providing HAAS functions to providers in emerging markets (e.g. Africa, Asia) by leveraging the talent pool in India, whilst taking advantage of its prestigious global status and existing infrastructure (IT, financial, communications and regulatory).

5.5 Public Private Ecosystem Integration

The HAAS model might herald a new breed of private-public partnership models with the private health sector, taking the lead to shape offerings matching governmental needs for two reasons: Firstly, the likelihood that the role of the local health authorities could become increasingly more regulatory than direct service provision. Secondly, following extensive investment in addressing the COVID-19 crisis, governmental interest in upfront investment and direct partnership might be less than before. This would create certain service delivery gaps, which could translate into increased opportunities for third parties to step in to deliver services to fill in those gaps. Also, an à la carte service as described above would become extremely relevant in supporting these authorities to avail localized solutions to be used when needed, namely during crises. For example, buying on-demand ICU capabilities during another spike in demand for critical care services.

Further, there are possibilities of Business Process Outsourcing (BPO) and Knowledge Process Outsourcing (KPO) services being handed over to other component organizations, leaving providers to concentrate on their core strengths of patient care delivery and freeing them from sundry non-revenue generating activities.

We have, in the next section, presented 6 solutions namely radiology, remote patient monitoring, command center, tele critical care, retail health and healthcare financing which we think lend themselves perfectly to HAAS.

26 https://www.cognizant.com/perspectives/new-provider-business-models-for-healthcare-on-demand

6 Enabling Solutions

6.1 Radiology Solutions

Integrated Radiology Workflow Suite

This transformative solution is a turnkey offering, combining Philips' Virtual Imaging and Teleradiology platforms with the clinical expertise of VPS Healthcare, to deliver outsourced radiology image acquisition, exam reporting, patient management and virtual imaging operations solution for improved efficiency and effectiveness.

At the heart of this solution is Philips' systems approach to diagnostics imaging services that puts the patient front and center throughout their journey. This approach to coordinating the complexities of the workflows of diagnosis and treatment as a system is key to enabling a seamless experience that takes into account the clinical, operational and economic outcomes associated with realizing the promise of precision diagnosis and precision medicine.

Core solution capabilities

Automated messaging
Communication via SMS, email, voice and paper mailings

Customized outreach
Library of best practice scripting can be tailored to your needs

Scalable platform
Cloud-based delivery that is easily extended across departments and service lines

Workflow & system integration
Simple deployment to complement existing IT and clinical workflows and seamlessly integrates with your EMR

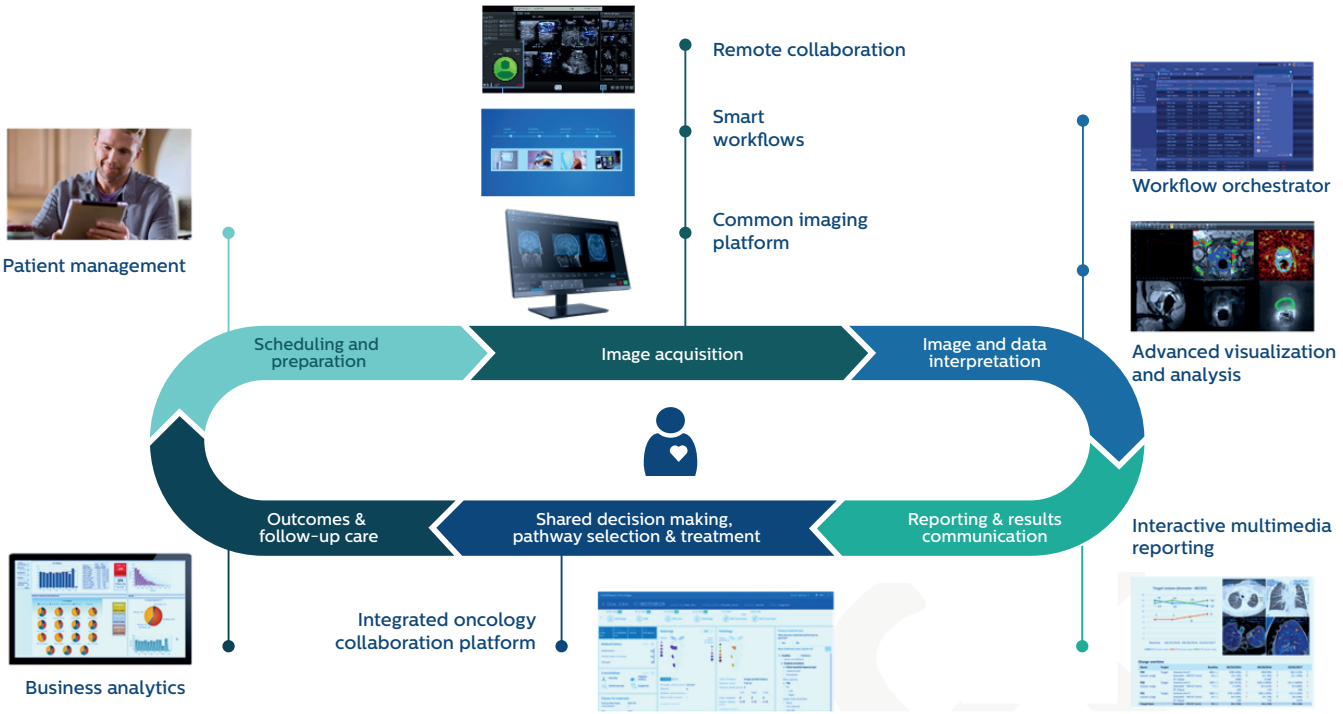
Actionable reporting
Dynamic reports delivered to your team to trigger interventions

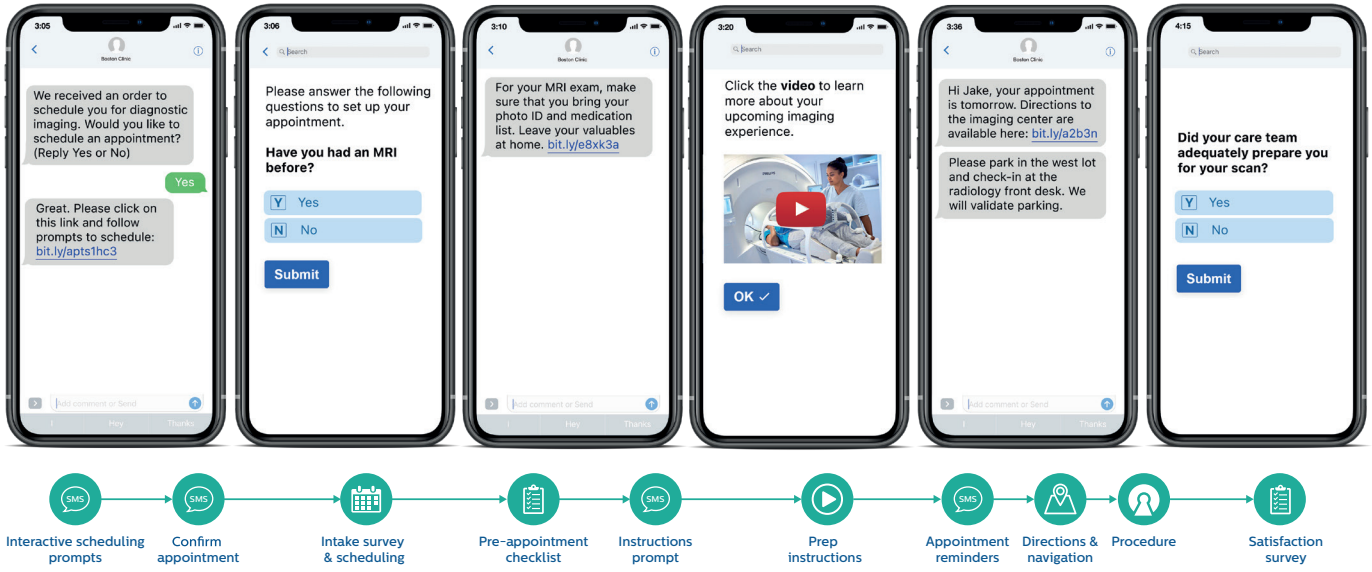
It begins with innovating to connect clinical capabilities and optimize workflows around patient needs. Artificial intelligence embedded within each step in the system allows this connection to deliver on both a timely precision diagnosis and specific treatment outcomes. It is this precise diagnosis that informs all that occurs prior to the journey, and all that occurs subsequently in terms of treatment, follow-up, assessment, monitoring and even a transition toward home care. In doing so, we enable clients to achieve improved patient experience, improved staff experience, and better outcomes – all at a lower overall cost.

Patient Management–Scheduling and Preparation

The Patient Engagement Manager offers a multi-lingual, multi-channel patient communication platform, so that institutions can automate their communication with their patients across the diagnostic, ambulatory, and surgical settings.

By serving as a digital liaison, these customizable navigation solutions allow patients to complete their pre-appointment tasks, show up on-time, and continue to follow care plan instructions long after their visit or procedure.





Teleradiology

Teleradiology is the ability to obtain images in one location, transmit them over a distance, and view them remotely for diagnostic reading or consultation purposes. This solution has the following unique features:

- Utilizes existing technology and capabilities
- Operates on a centrally managed workflow for single and multi-site environments
- Has a zero Foot Print Report Request
- Makes the supporting exam data available to the radiologist at any reading location
- Eliminates interfaces with RIS/HIS type systems
- Web-based and accessible anytime, anywhere, via a PC with an internet connection
- Requires no integrations between systems at the remote site and the service provider
- Can create reports wherever images are viewed
- Makes extending to additional sites efficient, fast & low on costs

Advanced Teleradiology workflow uses a unified Imaging Platform that enables the best quality reports with minimal turnaround time. It provides a physical connection between the DICOM data, and the exam information and moves together with the study as a single entity.

Benefits for referring physician:

- Improves the clarity of the report and shortens the time it takes to read it
- Hyperlinks allow easy viewing of bookmarked findings as part of the whole imaging study
- Tables and graphs clearly track progress of findings over time
- Hyperlinks allow viewing comparisons of prior studies in Vue Motion (enterprise viewer)
- Hyperlinks to send an email to the radiologist and improve the communication

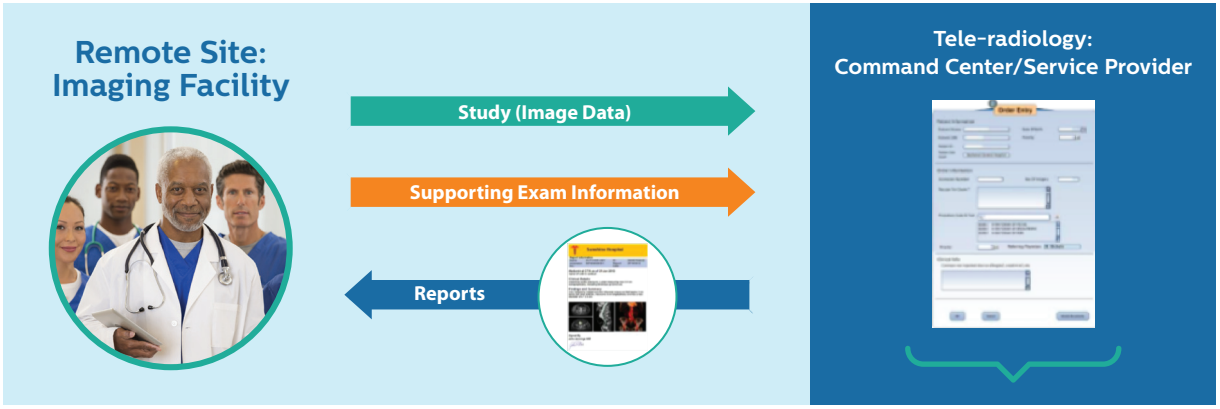
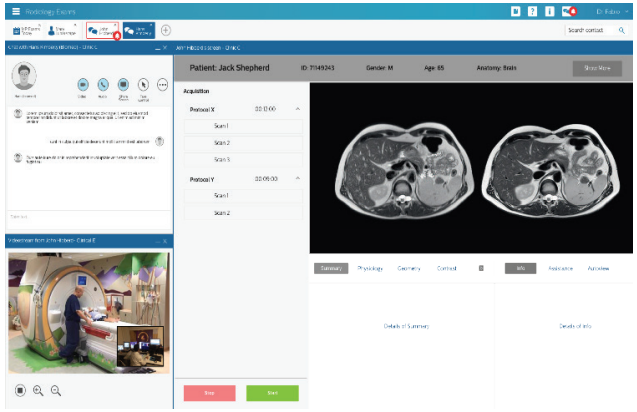


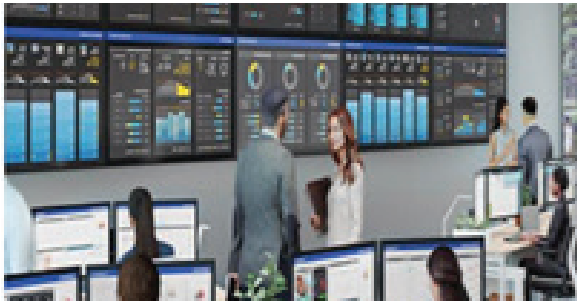
Image sharing:

It enables radiologists to efficiently manage their work from anywhere without compromise.



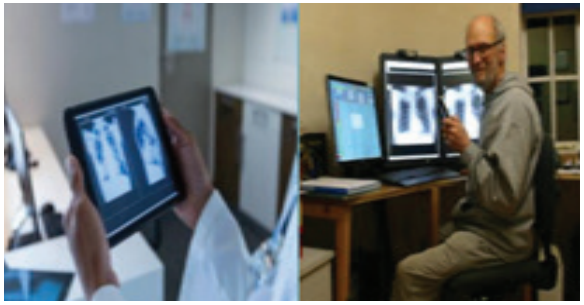
Reporting from workplace

Hospital/Services provider



Reporting from Datacenter

with powerful set of analytic tools



Reporting from Anywhere

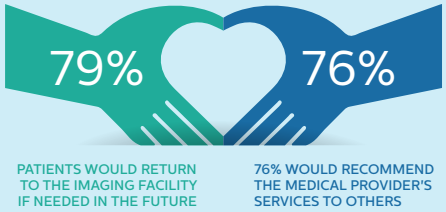
with powerful set of analytic tools

In addition, all patients have access to both images and multimedia reporting from the internet.

ACCESS TO A

PATIENT PORTAL

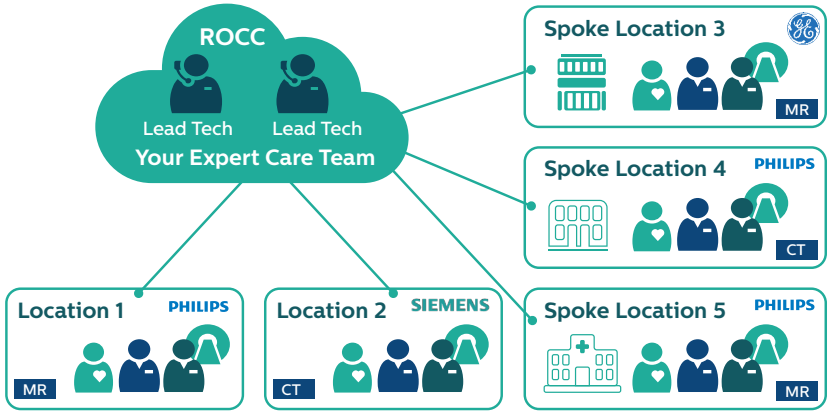
WOULD POSITIVELY IMPACT PATIENTS' RELATIONSHIPS WITH THEIR MEDICAL PROVIDERS



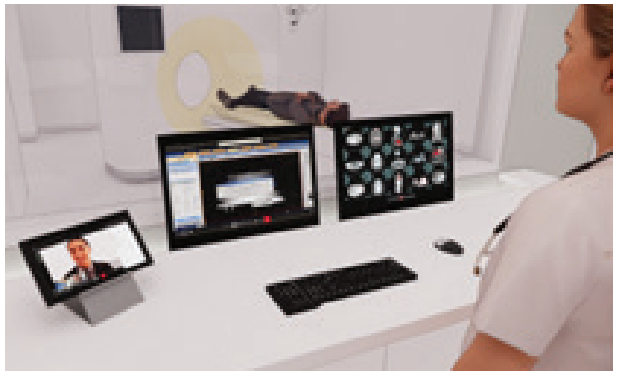
Radiology Operations Command Center (ROCC)

The Radiology Operations Command Center solution is a vendor-neutral, multi-modality (MR and CT) and virtualized imaging operations solution that works across multiple imaging sites, enabling an efficient hub-and-spoke operation for imaging.

With seamless telepresence, it enables care teams to collaborate throughout the enterprise and imaging networks to stretch their expert talent in their main hubs, making it available across all their sites seamlessly.



ROCC allows for virtual scanner access on a highly secure collaboration platform for tele-acquisition of images. It enables expert technologists in the command center to oversee multiple scanners at the same time, and it even has an option for a full view of the room, control screen, patient positioning and on-site personnel. An on-site team will ensure high-quality and safe on-site patient care — consent, IV, access and contrast administration.



Virtual Scanner Access

- Remote Access to Console Screens and peripherals
- Seamless Multi-room context switching
- Multi-level access based on credentials

Collaboration Platform

- Two way in-workflow communication
- Tablet Type interface for technologists
- In-workflow one-touch collaboration
- Multi-party collaboration
- Fully auditable virtual tracks
- Enterprise Grade Security and Privacy compliant
- Lean IT Deployment
- Recordable bandwidth consumptions

Performance Management and Analytics

An operational informatics platform, combined with a flexible suite of continuous improvement services, enables clinical and operations managers to visualize, track and optimize their performance.

Metrics

Operational

- Utilization
- Staff performance
- Repeat imaging
- Low-value imaging
- Uptime

Clinical

- Image & report quality
- Dose
- Follow-up tracking*

Intelligence

Analytics & Discovery Application

Workflow Improvement Applications

Improvements

Operational

- Adjust equipment
- Preventive service
- Targeted training
- Targeted education

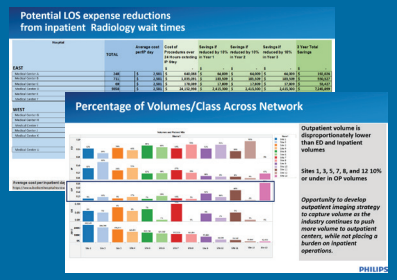
Clinical

- Adapt guidelines
- Adapt workflow
- Adapt protocols

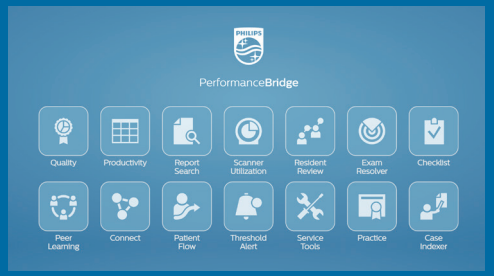
Adaptive intelligence to help automate

The solution empowers leaders to make meaningful decisions that maximize opportunities and allow them to do more with less, while maintaining focus on patient care.

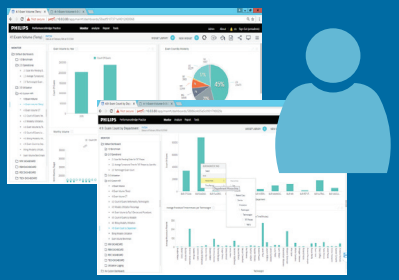
Enables continuous improvement across the imaging enterprise with interoperable, customizable analytics and workflow solutions



Baseline & benchmark reporting
Analysis and reporting of operational and business performance to identify opportunities



Targeted analytics & workflow solutions
Tools and applications for specific problem areas, tailored to meet current needs and long term strategy



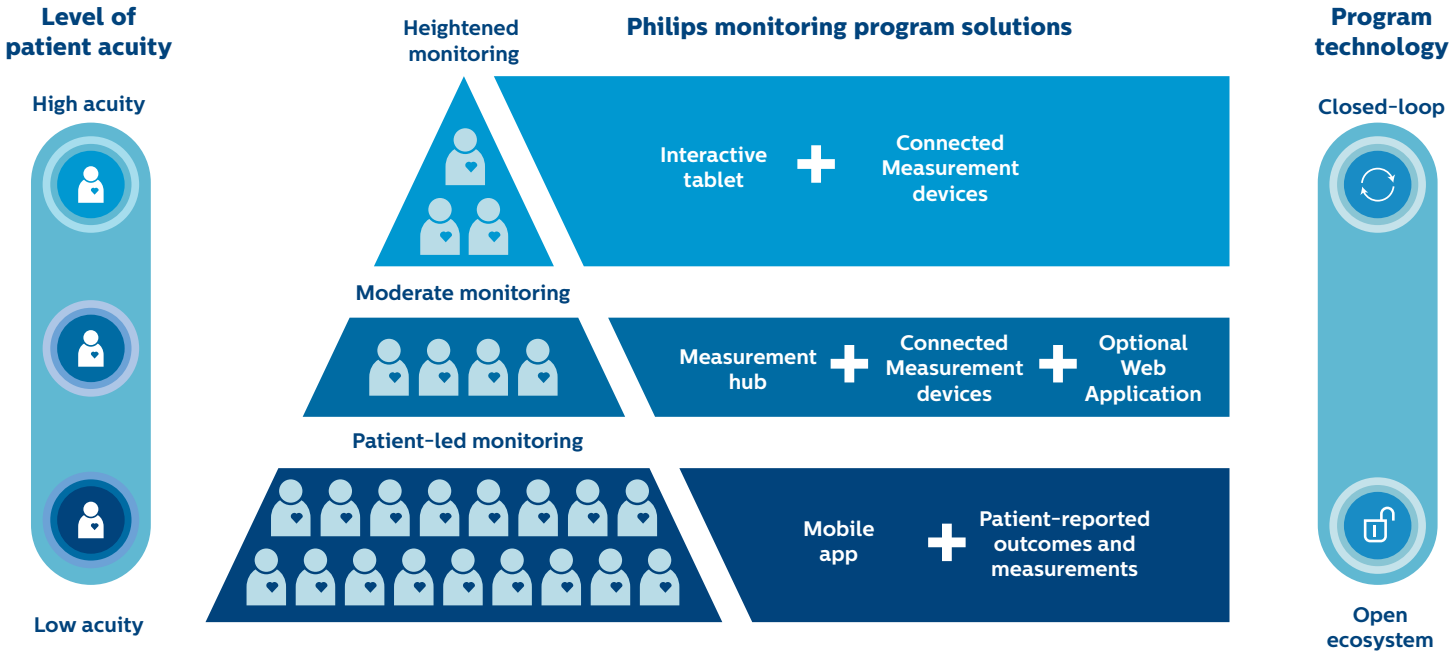
Full business intelligence solution
Integrated practice management solution with a Solution Advisor to drive improvement processes

Our comprehensive, data-driven clinical operations solutions leverage Philips' deep clinical experience gain insight into specific challenges, and create actionable recommendations for a path toward improvement through both our applications and services

6.2 Remote Patient Monitoring (RPM)

6.2.1 Monitoring patients across the acuity spectrum

Philips has solutions to help hospitals monitor and manage populations across the spectrum of patient acuity. Acuity can take on multiple meanings, depending on the problems an organization is trying to solve, and the populations they need to impact. For example, acuity could be an assessment of the patient's risk. That's why it's important to think about the full spectrum of patient acuity and identify the most efficient and effective ways to impact care for high-risk, moderate-risk and lower-risk populations.



At the top of the spectrum will be the highest-risk patients. These patients likely have multiple co-morbidities or a complex medication regimen, e.g. a chronic condition like diabetes that isn't well managed, or someone with a recent inpatient admission or major surgery. These patients are often the highest utilizers of care with lots of ED visits or even recent in-patient admissions. As we move down that acuity spectrum, one could expect patients that are probably at lower imminent risk for unplanned encounters, readmissions or other acute events, but without intervention or support, they might not remain in that stable state.

It is expected that patients will move up and down this spectrum as their condition and health changes over time, and the level of monitoring and supported solutions can be changed accordingly. To the right of the pyramid, you'll see the Philips solutions range, from a fully Philips-provisioned, connected measurement and patient device set to a more open model that may or may not involve connected measurement devices and use of surveys and education within a mobile app. These solutions are flexible and can meet the organization's needs to monitor patients at varying levels of risk.

Level of patient acuity	Equipment	Capabilities	Base Sale
High acuity	• Secure tablet • Blood pressure meter • Pulse oximeter • Weight scale • Glucose meter accessories	• Clinical platform: measurement/trend view • Two-way video communication • Tasks and reminders • Patient satisfaction and wellness surveys • Pre-loaded educational content	Clinical platform, tablet, Bluetooth devices + Video extra cost + Upsell: PMAS, PERS
	• Plug-in hub • Devices above except glucose meter accessory • BYOD available	• Clinical platform: measurement/trend view • Tasks and reminders • No two-way video communication • Optional web app supports patient satisfaction and wellness surveys	Clinical platform, hub, Bluetooth devices + Web app extra cost
Low acuity	• Email or mobile application	• Patient-reported outcomes questionnaires/surveys • Clinical platform: measurement/trend view • Tasks and reminders	Clinical platform, mobile app

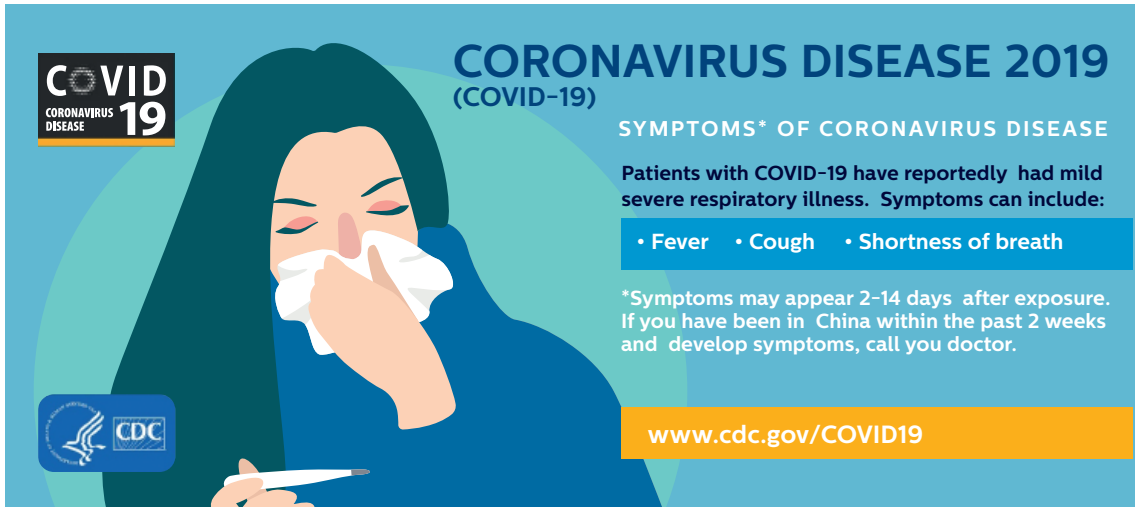
Peripheral Devices by Protocol

Program	Measurements in Protocol	Philips Devices in Protocol
Coronary Artery Disease (CAD)	Blood pressure Temperature (manual)	Blood pressure cuff
Comprehensive Care for Joint Replacement (CJR)	Blood pressure/Pulse Temperature (manual)	Blood pressure cuff
Chronic Obstructive Pulmonary Disease (COPD)	SpO_2 Temperature (manual)	Pulse Oximetry devise
Diabetes	Glucose Blood pressure Temperature (manual)	Glucose Meter Accessory Blood pressure cuff
Congestive Heart Failure (CHF)	Weight SpO2 Blood pressure/Pulse Temperature (manual)	Weight scale Pulse Oximetry devise Blood pressure cuff

Remote Patient Monitoring Hospital (RPM-H@H) at Home for COVID-19

RPM-H@H utilizes home-based, self-applied, medical grade sensors that allow continuous monitoring of key vital signs and symptoms including those related to COVID-19. It may enable early detection and directed interventions that prevent exacerbation and/or hospitalization and preserve bed capacity for higher acuity patients requiring admission. It may also enable earlier discharge of patients hospitalized with COVID-19 to expand bed capacity for new COVID-19 patients requiring admission.

COVID-19 Symptoms and Monitoring



BioSticker

Skin Temperature

Coughing

Respiratory Rate @ Rest

- FDA - cleared multi-parameter vital signs monitor
- Minute to minute temperature, respiratory rate, coughing tracker
- 30-day continuous battery life
- Bluetooth data transmission
- 'Stick it on and forget it' auto on-body detection passive data capture ease of use

RPM-H@H of High-Risk Individuals for COVID-19

Elderly patients complex chronic disease (CHF, COPD, diabetes, etc.) and other immunocompromised patients (transplants, oncology, etc.) are at high-risk for morbidity and mortality associated with COVID-19. These individuals requiring Quarantine (COVID exposure) or Isolation (COVID confirmed) are likely at extreme risk for hospitalization and ICU admission. RPM-H@H of vital signs and symptoms directly associated with COVID-19 (temperature, respiratory rate, coughing frequency) may enable early detection and directed interventions that prevent exacerbation and/or hospitalization of these patients. At-home remote monitoring may also reduce unnecessary exposure to medical personnel and reserve hospital bed capacity for higher acuity patients.

BioIntelliSense RPM - H@H for COVID 19

- **High Risk Criteria:**
  - Elderly (70+) with Complex Chronic Disease
  - Solid Organ and Bone Marrow Transplant Patients
  - Cancer Patients Undergoing Chemotherapy
- **Extreme Risk Criteria:**
  - High Risk patients requiring quarantine (COVID exposure) or isolation (COVID confirmed)
- **Early Discharge "Hospital at Home"**
  - Early discharge of patients hospitalized with COVID-19 to expand bed capacity for new COVID-19 patients requiring admission

- RPM APPLICATIONS + DASHBOARDS
- COMMAND CENTER SERVICES
- HEALTH PROGRAMS & CARE PLANS

6.2.2 Monitoring patients with chronic diseases

Definition

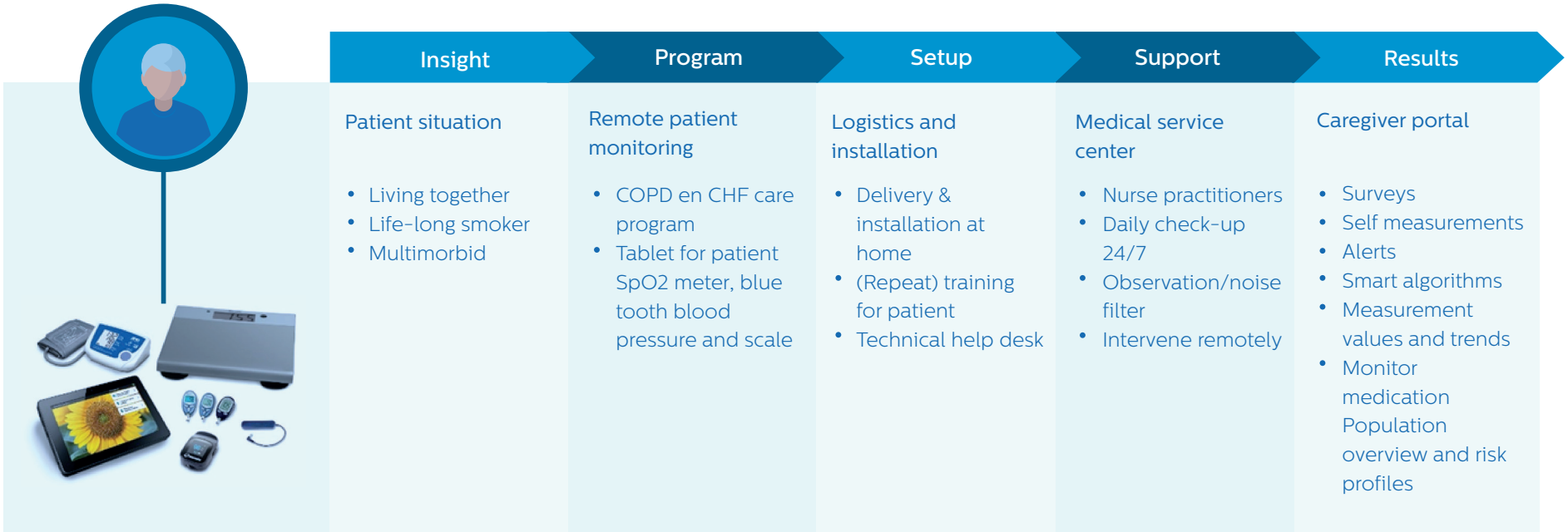
Remote patient monitoring is one powerful way to reinforce busy care providers, aligning staff to care volumes and shifting patient monitoring and management to remote locations even halfway across the world where there is 24/7 support. This round-the-clock, remote surveillance by skilled professionals – and the decision-making algorithms that assist them – provide early warnings for proactive care and continuous programmatic improvement.

The Remote Patient Monitoring (RMP) Program

With Philips remote patient monitoring program, one can virtually track the health of patients, whether they are in their home, assisted living or even skilled nursing facilities. One can collaborate with his/her virtual care teams to monitor patients and help detect problems, before they potentially escalate or even lead to readmissions.

These solutions support organizations, not only in monitoring for high-risk patients, but also for rising-risk and lower-risk populations across the full range of acuities. Our remote patient monitoring solution includes a clinical dashboard for providers and the 'care companion' application for patients.

The following diagram presents the steps involved in implementing a successful RPM program.



Benefits for the care network

Patient:

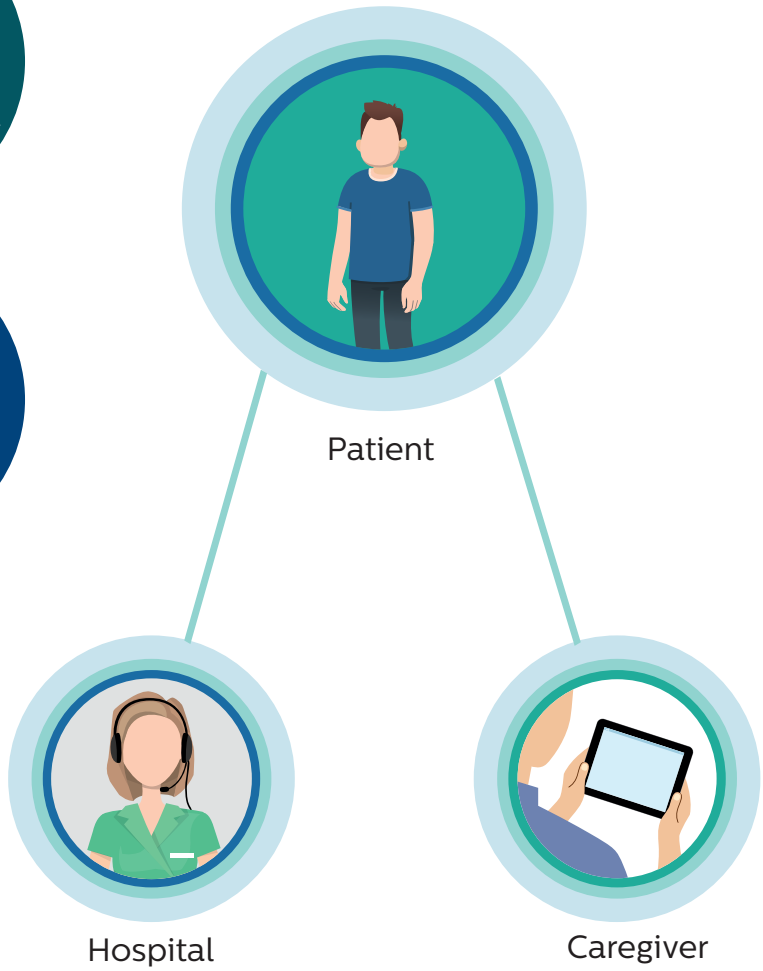
- A sense of safety – monitoring, follow-up and management of symptoms
- Competence – training to adequately use equipment
- Medication management Prevention – using modules to increase physical activity and stimulate behavioral change

Hospital:

- Assign patient to the right program
- Validated protocols from post-acute care to self-management
- Insight in outcomes through questionnaires

Caregiver:

- Possibility to improve quality of care, reduce exacerbations and risk of readmission
- Increase visibility of transfer from hospital to home



Impact of RPM programs

RPM programs have led to reduction in care and improved patient experience. For example, optimization of care pathways for patients with chronic heart failure resulting in reduction in the number of admissions, reduction in the number of hospitalization days, and cost savings per patient in 6 months.[26]

26. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4446277/

“RPM is a great method that helps us offer a large group of heart failure patients the care they need quickly and efficiently. It’s an important instrument to maintain a manageable flow of patients.”

Michiel Nagelsmit MD,
Scheper Hospital, Emmen

6.3 Command Center

Definition

A command center is typified by a physical space/room, where groups of people/functions are co-located and collaborate to make fast, reliable and efficient decisions in real-time, based on information provided on visual displays or mobile devices. Though the command center concept originated in the military, it is applicable to any highly complex, dynamic, interconnected system or organization that requires highly reliable and real-time co-ordination, e.g. NASA's mission control, air traffic control, rail network centers, traffic control, etc.

Command centers in healthcare

Hospitals like that of VPS Healthcare are complex, dynamic, interdependent systems that not only manage care delivery for each individual patient, but also for thousands of patients who pass into, through and out of their care environment. They are required to make highly reliable decisions every minute, in order to both ensure safety and outcomes in an efficient and coordinated way. Thus, the concept of a command center could be of immense value in healthcare settings - a centralized control room equipped with real-time decision support tools combined with standardized responses, processes and protocols within a single hospital or across multiple facilities or a region. The 3 fundamental tenets of a command center are

At the onset of the COVID-19 pandemic, VPS Healthcare quickly realized the need to operationalize a Command Center, swung into action and created a nodal center to manage the pandemic. This was set up in the newly launched Burjeel Medical City in Abu Dhabi, where the entire clinical and operational management for the group in UAE was conducted. This included deployment of clinicians, oversight of clinical practices, recruitment and deployment of staff based on urgency of need, procurement of critically required drugs, consumables and equipment. All of this was done by utilizing real-time actionable data over a digital backbone by which VPS Healthcare touched nearly a third of all COVID-19 cases in the UAE and successfully managed a global sports event hosted in the UAE. With these lessons learnt, VPS Healthcare is now in the process of setting up a much larger state-of-the-art Command Center to further leverage the lessons learnt and run a more efficient healthcare organization.

Enterprise Care Collaboration Center

Enterprise Care Collaboration Center – The next generation Command Center that improves the efficiency and quality of care delivery

We strongly believe that a close collaboration between the clinical staff and the needed technology is key to ensuring best practices, powering data-driven improvements and improving the patient experience. Because of that, we refer to the next generation of Command centers as Enterprise Care Collaboration Center, with the emphasis on 'Collaboration'.

It is worth mentioning that - it is more than 'just' technology. The power is in the combination of staff and technology. Great technology does not improve healthcare by itself. It's the actions taken by staff based on the insights provided by technology - that makes the real difference.

This fosters a coordinated approach to enhance patient safety, improve staff and patient experience and improve care reliability, efficiency and outcomes across the care continuum and beyond the hospital walls. A Care Collaboration Center does not need to be in one place, but can be virtual on different locations and drive remote collaboration which is a necessity in today's post COVID-19 world than ever. Additionally, this collaboration and shared space assist in centralization and service line consolidation that further improve operational speed of execution and efficiency.

Types of Care Collaboration Centers

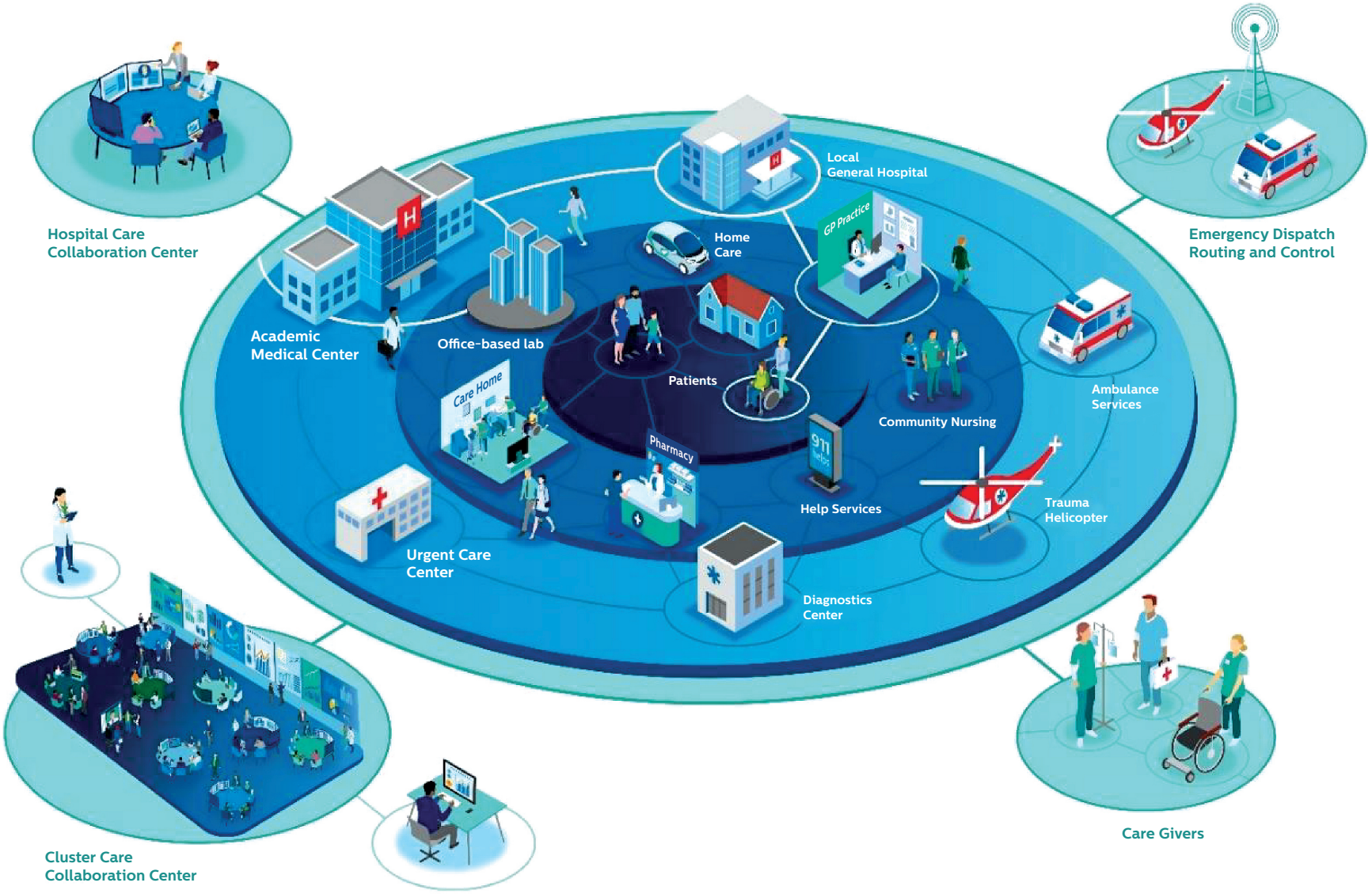
There are many types of Care Collaboration Centers, depending on the main challenges faced by the hospital. Some are operationally focused to drive throughput, utilization, performance or length of stay; some are focused on the clinical aspects of care delivery and maximizing quality, outcomes, workflows and adherence to pathways.

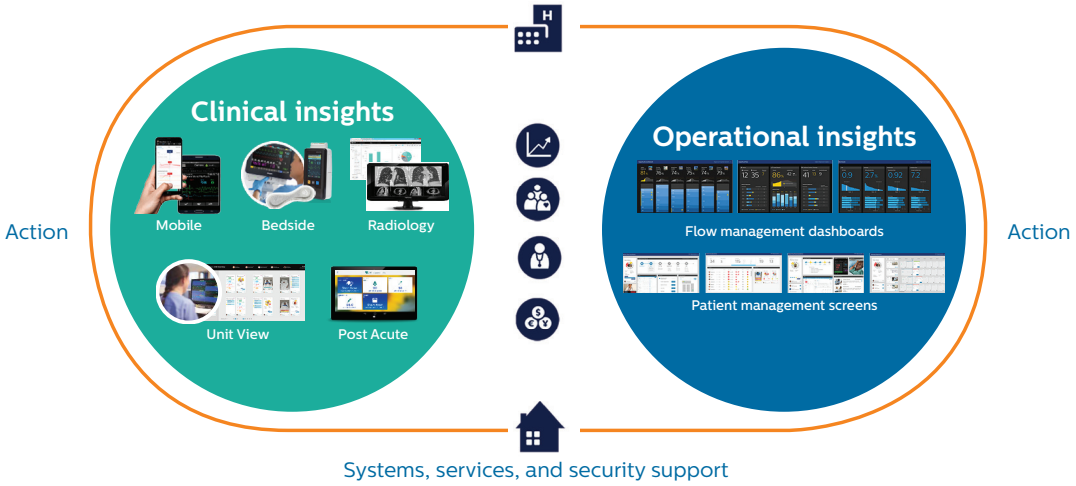
Thus, there is no 'standard' one size fits all as such. The successful creation of this enterprise wide improvement requires a close collaboration between the hospital staff, management/ leadership and the technology provider (Philips).

For example,

- Need to more efficiently co-ordinate and deliver critical care via a centralized tele-ICU hub
- Need to provide centralized operational control for an imaging department via a Radiology Operational Center
- Need for enterprise-wide co-ordination of patient flow and capacity throughout the hospital
- Need for co-ordination and orchestration of virtual care
- Need to monitor and balance capacity and activity across a network of hospitals to optimize the utilization of multiple facilities

Thus, Command Centers could perform a singular and very specific function, or more often, expanding to providing multiple functions supported with a suite of analytics designed to support multiple use cases. For that reason, every Care Collaboration Center program is unique to the specific needs of the healthcare organization and evolves over generations.





Clinical and Operational convergence producing actionable insights

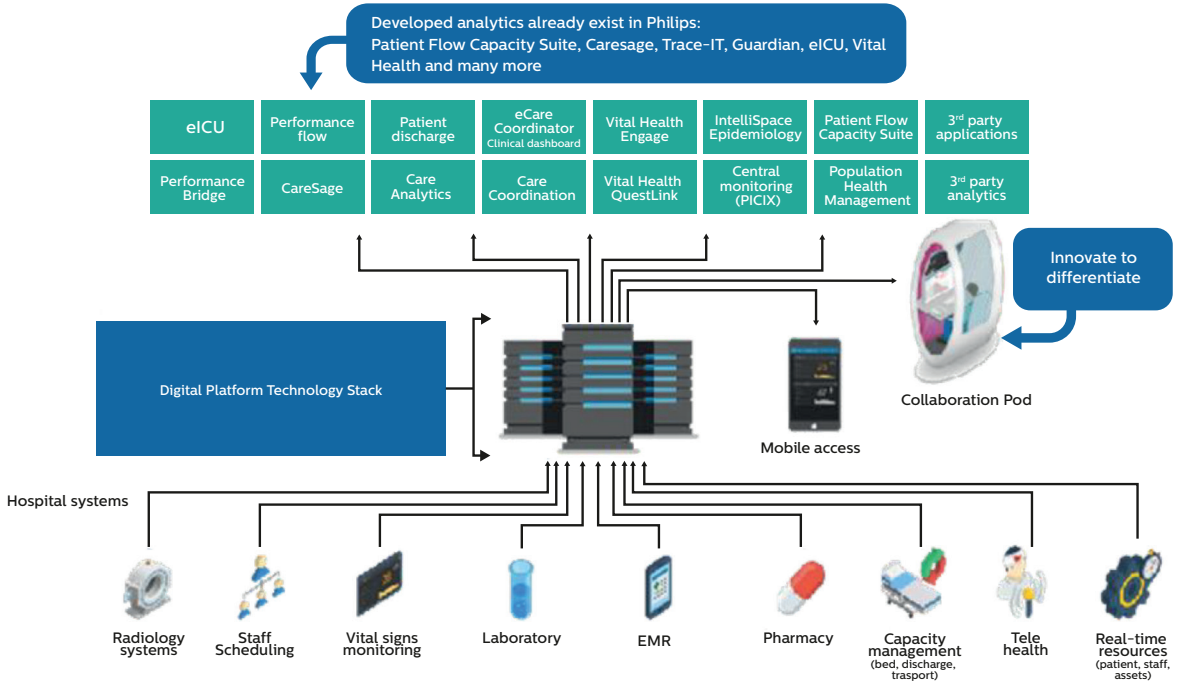
We see the future is a much more integrated environment where clinical systems better inform operations to transition patients and also leverage advanced analytics. Thus, the main purpose of a collaboration center is advanced and broader **care orchestration** by combining clinical & operational data and converting this to actionable intelligence.

It can help the hospital become more agile and relieve the clinical staff of administrative and process related activities.

The ultimate goals is not to just to get the technology to run smoothly, but even more important is how the enterprise is going to act upon the clinical and operational insights that are provided.

Creating a customized ecosystem powered by a collaboration center

An effective collaboration center integrates with existing technology stack to leverage its current strengths. The aim is to bring all of these (data) inputs together, so the data can be cleaned and analyzed, before they are transformed into actionable insights for the staff to act upon.



Benefits of command center in a healthcare setting

- Facilitates standardization of care in all settings and locations
- Centrally manages patient care
- Aids better flow management using AI and Machine learning to optimize and prioritize transitions of care within and between care settings
- Makes performance more transparent, comparable across region, hospital, unit and provider levels
- Proactively anticipates and manages risk by leveraging operational and clinical data
- Enables management of patients in the community with remote monitoring and population health*

"If there is any silver lining to the COVID-19 pandemic, it is the leapfrog adoption of digital solutions in the healthcare space... This is not only visible across both sides of the consulting table, but it also touches the entire provider ecosystem improving patient outcomes and enabling efficient operations."

Sumit Singh
CIO, VPS Healthcare

In conclusion, we see command centers evolve to real Care Collaboration Centers that are much broader than simply resource optimization and much more than a "patient care" center, that considers patient clinical status and resource to better deliver care both inside and outside of the hospital.

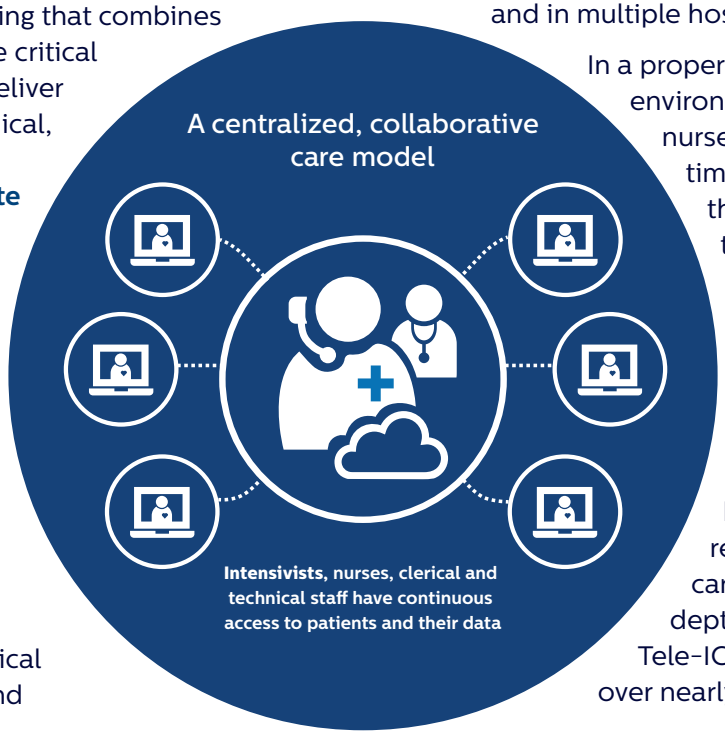
* For example, pre-hospital care services, including 24-hour ambulance fleet management, are delivered even by partner organizations such as RPM of VPS Healthcare

6.4 Tele Critical Care

A tele health solution transforming outcomes in critical care
This transformative solution is a turnkey offering that combines the Philips acute tele health platform with the critical care clinical expertise of VPS Healthcare to deliver outsourced tele critical care for improved clinical, operational and financial outcomes. This tele critical care solution offers **centralized, remote clinical surveillance** by skilled professionals, proprietary algorithms that provide **early warnings** for proactive care, and continuous programmatic improvement.

A collaborative model – a second set of eyes on the hospital's most vulnerable patients that does more with less in critical care across health system.

Just like a centralized air traffic control center monitors and maintains the safety and coordination of thousands of planes and passengers in real time, these centralized critical care clinicians are able to monitor patients and hospital flow and coordinate care delivery in one unit, multiple units, and in multiple hospitals - even around the world.[27]



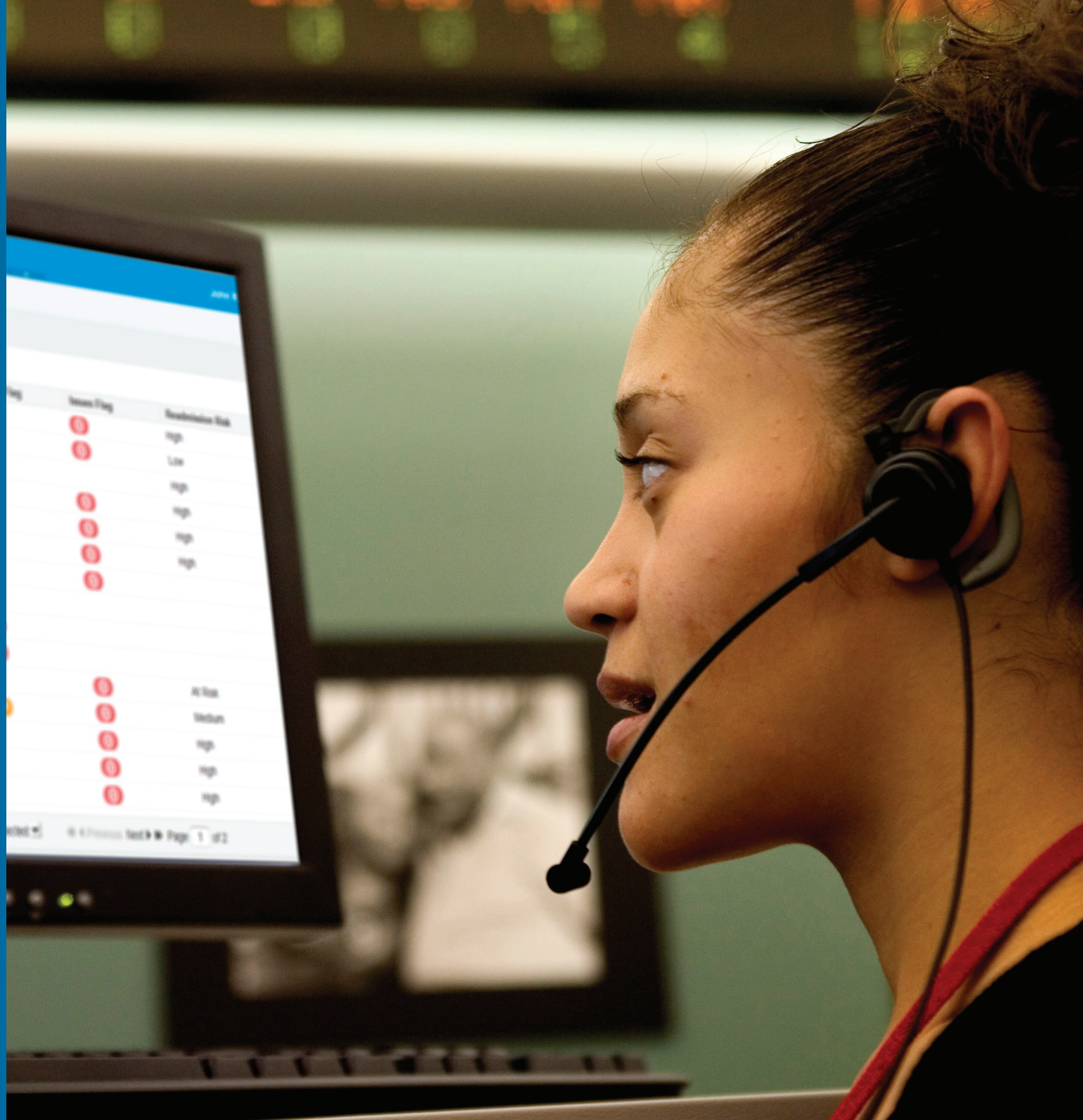
In a properly implemented and well-run tele critical care environment, a team of 1 intensivist and 3 critical nurses could monitor up to 150 patients at a given time, allowing bedside caregivers to increase their direct patient care time. The clinicians in the hub monitor and assess patients and alert the bedside team at the earliest indication of patient deterioration, in order to prevent adverse events from taking place. Bedside teams in turn get 24/7 on demand support at the push of a button.

This **centralized collaborative model** can help expand access to specialized care to remote locations and transform the cost-to-care equation. This unique offering leverages the depth and breadth of Philips' experience in the Tele-ICU arena that has been iterated and refined over nearly two decades.

27. Woodruff Health Sciences Center. Emory cares for ICU patients remotely, turning 'night into day' from Australia. 2018. Taken from: http://news.emory.edu/stories/2018/05/buchman-hiddleson_eicu_perth_australia

At the core of the Philips tele critical care is the eCare Manager, a best in class, FDA 510k-cleared acute tele health platform, that contains a comprehensive suite of several integrated purpose-built tools, features, capabilities and interfaces for seamless data access and presentation.

This platform enables a centralized, intensivist-led care team (called the Hub) to remotely help bedside staff deliver optimal care, by combining A/V technology, predictive analytics, data visualization, advanced clinical decision support and multiple reporting capabilities.



Features of the eCare Manager:

1	Acuity-based based census	Patient information is presented in a visually intuitive, dashboard-style user interface, by incorporating data typically fragmented across many units and hospitals into a single-point patient census which illustrates key physiologic indicators, thereby optimizing population management.
2	Two-way integrated A/V solution	Allows the Hub clinicians to see what the bedside practitioner can, including such details as bedside vital signs via web-viewer applications, medication infusion rates and ventilator waveforms.
3	Predictive analytics	Based on de-identified data from between 200,000 to 700,000 ICU patients. AI-enabled alerting (Automated Acuity Scoring and Display, Discharge Readiness Score, Severe Sepsis Screening Prompt, New Clinical Deterioration Algorithm etc.) to help providers identify patients who are high-risk at any given moment and allocate resources accordingly for clinical and operational efficiency.
4	Reporting	A complete set of clinical reports, enabling continuous evaluation of compliance with ICU best practices, monitor severity-adjusted outcomes, and evaluate and benchmark ongoing operations.
5	Population Management	With lengthy tele-ICU experience, Philips leverages a longitudinal data registry of more than 2.5 million patient stays. This registry enables continuous innovation in the critical care space, allowing participating ICUs to move beyond the basic patient management approach of the EMR to provide comprehensive population management.
6	Interoperability	Vendor agnostic platform to enable 3rd party EMR/HIS and Real Time Wave Form viewing.
7	Research and innovation	The eICU Research Institute database contains the largest collection of discrete, de-identified critical care patient data in the world (over 3.5 million patient stays in tele ICU-enabled critical care units).

Expansion to Med-Surgical/Emergency Department

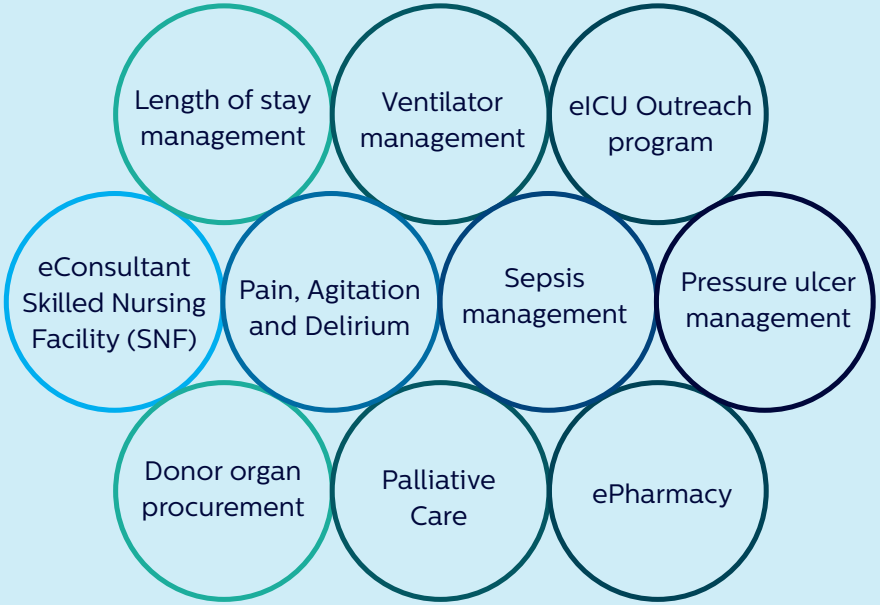
The interoperability of the Philips eCareManager technology, coupled with various clinical programs, means the platform is extensible to clinical domains beyond the ICUs. For example:

- ED - Boarding ICU patients when units are full, triage/ transport coordination, and remote specialty consultation
- Rapid Response / Medical Emergency teams
- Post-anesthesia Care Unit (PACU)
- Labor and Delivery
- Pediatric Critical Care Consultation
- Long-term Acute Care Hospital (LTACH)

Implementation and sustained success

The hallmark of the solution is its modular approach to deployment; and the ability to scale flexibly in accordance with the organizational readiness and budget.

A multi-disciplinary team of a Project Manager, Clinicians, and Technical Professionals works closely with client teams, providing clinical transformation guidance and assistance through all phases of deployment. Success depends on how critical care is conceived, delivered and governed, how the change to the practices is executed, and how processes are continually improved to affect outcomes in a rigorous and measurable way. We partner with our customers to successfully execute the transformation and enable them to continue the journey successfully; this commitment is what sets us apart. This also includes clinical programs implementation including



Using the Philips tele critical care solution, many customers have succeeded in improving adherence to best practices and reducing complications[28], have enhanced patient and caregiver satisfaction[29], and improved financial well-being together with overall organizational quality and efficiency.[30]

28. Lilly CM, Cody S, Zhao H, Landry K, Baker SP, McIlwaine J, et al. Hospital mortality, length of stay, and preventable complications among critically ill patients before and after tele-critical care reengineering of critical care processes. JAMA. 2011 Jun 1;305(21):2175–83.
29. Emory Health. CMS report: eICU program reduced hospital stays, saved millions, eased provider shortage. April 5, 2017. Taken from https://news.emory.edu/stories/2017/04/emory_eicu_program_report
30. Lilly CM, Motzkus C, Rincon T, Cody SE, Landry K, Irwin RS. ICU Telemedicine Program Financial Outcomes. Chest. 2017 Feb 1;151(2):286–97.

6.5 Retail Health

Overview

'Retailization' of healthcare, also known as 'Retail Spillover to Health', refers to a shift in the delivery of healthcare from a physician-centric model to a more consumer friendly, patient-centric model – like the way retail goods and services have long been delivered to customers. The hallmark of retailization is the provision of healthcare services that are accessible, convenient, holistic, affordable, and patient-friendly as expected by today's intelligent, informed and empowered patients.[31]

Retailization originated in the United States with certain retailers (chain drug stores, grocery stores, mass merchandisers, and club stores), broadening their corporate growth strategy to include health and wellness services via in-store pharmacies, health care clinics, health and wellness programs, and other consumer-focused initiatives.

Retail and healthcare intersection and convergence

We see a number of inherent ways that retail and healthcare intersect with each other. This intersection is the foundation for a convergence of retail and healthcare driven by the following drivers.

Redefining the relationship between a patient and the healthcare provider from the traditional patient-consumer concept. In the new model, the consumer is in control of their health and well-being. The expectation changes with regard to quality, speed, convenience and cost for the service availed.

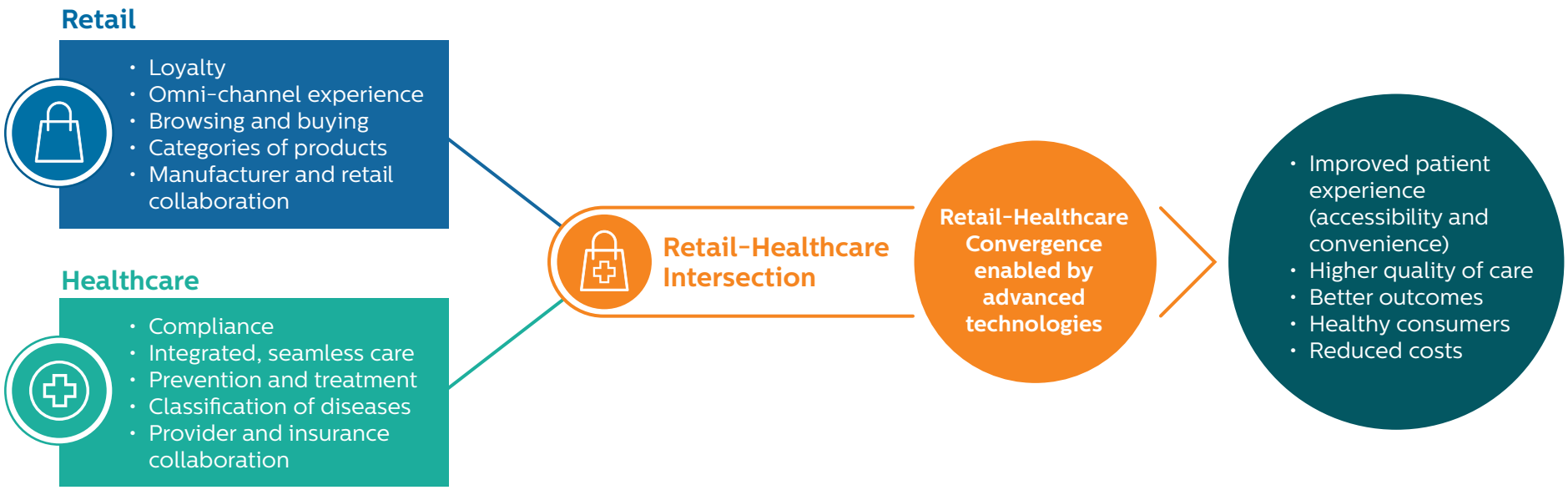
The retailers' need to increase store traffic, support cross-selling and up-selling, improve the customer experience, enhance brand recognition, and grow revenue and market share.

The healthcare providers' need to meet changing patient expectations, attract and retain patients, increase visibility and brand prominence, and remain competitive to grow patient base and revenue

Technological advances, healthcare reform, aging population, increasing prevalence of chronic diseases

31. the-retailization-of-healthcare-a-87856/

The diagram below demonstrates the intersection between healthcare and retail leading onto convergence.



Retailization and COVID-19

Pre-COVID, retailers like Walmart, Amazon, Best Buy and CVS embarked on leveraging opportunities in healthcare and create convergence of retail and healthcare. In December 2019, Frost & Sullivan predicted that 'Retailization' would be one of top 8 disruptors of the healthcare industry in 2020, as patients today have the same expectations of health providers as they have of any retailer or any other product or service, i.e. 'comparison shopping' consumer mindset.[32]

COVID-19 has accelerated the convergence of retail and healthcare trend to a new reality. At the peak of the pandemic, to increase testing capacity, additional coronavirus testing centers were established in some malls. Now, as we move forward, retail healthcare is poised to become an increasingly active player in the 'New Normal' health ecosystem, as social distancing has turned into an integral part of post-COVID life, coupled with patients' preference to stay away from hospitals, as well as providers' preference to keep patients away from hospitals **(walmart-and-amazon-lead-the-retail-pack-by-leveraging-healthcare/#77b1124a3d76)**. Inherent in this shift is a recognition that consumers have a choice in their healthcare, and convenience and accessibility are key drivers in this choice.[33]

32. top-8-predictions-that-will-disrupt-healthcare-in-2020/#33c749167f1e
33. https://medium.com/@parthdesai88/the-retailization-of-healthcare-emerging-themes driving-individual-care-choices-b94623a01e3f

Retailization & value-based care

As health systems' focus shift from treating sick people to proactively keeping people well, while at the same time reducing costs of delivering care, retail could play a key part in models focused on the cost and quality of a defined population.

From the providers' perspective, retail health could be the 'new front door to healthcare', delivering affordable out-of-hospital care (RetailJournal_Vol5_WEB.pdf), by utilizing relatively less expensive care settings for lower-risk patient. It logically follows that if the location is convenient and costs lower, patient could be more likely to use it or get their care earlier, before it progresses and requires a more intensive and costly care setting.

Gatekeeper role of retail healthcare

Retail clinics provide an opportunity to triage (in-person, as well as virtual) patients to identify who requires hospital-based care and who are best treated in the community setting including the patient's home. This would be similar to the 'gatekeeper' role of primary care providers and would help ration scarce resources, ensuring that patients get the right care they need and when they need it.

Rules of healthcare retailization

1 ***Go where the patients are***

Location, location, location! Oakland-based Kaiser Permanente partnered with Target to open a network of clinics in California. There are currently more than 1,900 retail clinics in the country, a number that's expected to grow to 2,800 by 2017.[34]

2 ***Make patients into partners for new initiatives***

Cleveland Clinic sought insight from patients in developing a new wellness program to find out what kind of program people would pay out-of-pocket. The program has enjoyed high enrollment and profitability, since the day it launched.[35]

3 ***Speak their language and aim for transparency***

Wisconsin's Aurora Healthcare invited patients to share their feedback on early drafts, Aurora was able to identify potential pitfalls and validate their approach, before the price list went public.[36]

A proposed model of Retail Health and Wellness Pod

A proposed model of retail health and wellness pods is presented in the following diagram. The pods would provide a wide range of evidence-based, well-defined, quality improvement focused services including

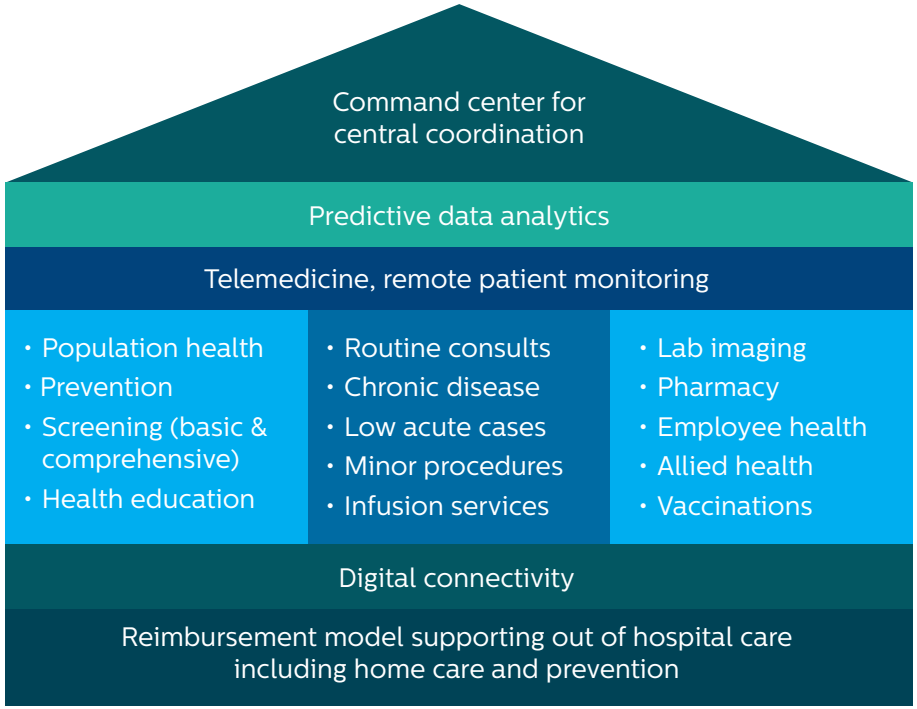
In-person care consultations, minor procedures, infusion, allied health (physiotherapy), pharmacy, dental, low acuity urgent conditions, chronic diseases, screening (basic & comprehensive, employee health assessment, labs, imaging

Virtual care remote consults, home monitoring, allied health (dietetics), basic screening, chronic diseases, remote reporting of diagnostics

Prevention population health initiatives, health education, supporting community based health promotion activities

34. https://www.visioncritical.com/blog/healthcare-retailization
35. https://www.visioncritical.com/blog/healthcare-retailization
36. https://www.visioncritical.com/blog/healthcare-retailization

The retail pods would utilize non-medical personnel, e.g. nurses, pharmacists, ancillary providers, population health experts, as appropriate within the limits of clinical safety. The following enablers would be critical to the success of the retail pods:



Enablers

- Well defined scope of clinical service - evidence based with a quality improvement focus
- Use of non-physician resources (nurse, paramedics, outbound call centers)
- Telehealth
- Leveraging data
- Digital transformation
- Appropriate reimbursement model

We envisage that pods be a strong advocate for reimbursement models with expanded coverage by demonstrating higher quality and lower cost services.

On the one hand, the pods would provide opportunities for the retailers to better engage with customers and enable them to make health conscious decisions (e.g. discounts for purchase of healthier foods). On the other hand, the changing face of brick-and-mortar retail would create continued opportunities for healthcare services to locate in repositioned mixed-use retail centers.

While the business case for entering the retail clinics market may appear attractive, sustaining performance and realizing the benefits of this strategy require a clear understanding of clinics' operational complexities, dedicated leadership, and strong senior executive support.

6.6 Healthcare Financing

Introduction

A new healthcare financing model is critical in enabling and sustaining the paradigm shift in healthcare delivery that has been catalyzed by the COVID-19 pandemic. With a move from the today's illness-focused approach to a more preventative wellness-focused approach, we now have the opportunity to redesign care delivery, as well as reimbursement models that would lead to better quality care at reduced costs while building healthier communities. Considering the significant unbudgeted investments made by both public and private sectors in order to manage the COVID-19 crisis, the payers, regulators and providers are now all looking for innovative ways of leveraging on these new investments to deliver quality care at an affordable cost. Thus, the aligned incentives have created a perfect stage for bringing about changes in the current reimbursement model to suit the new landscape.

As described earlier, we envisage increasing focus on Value-Based care to support care delivery in the new normal. The Health Maintenance Organization (HMO) financing model is one of the most commonly used payment models that would facilitate value-based care.

Health Maintenance Organization (HMO) financing model

A Health Maintenance Organization (HMO) is a medical insurance concept organization that provides health insurance coverage to a defined population group for a monthly or annual fee, where subscribers can access care only from a network of providers who are contracted to the HMO ("in-network" providers). It is a well-accepted working model with successful outcomes in the United States.

HMOs are designed to incentivize providers to deliver services targeted at maintaining the health of their patients cost-effectively through care coordination, prevention and empowerment. This integrated approach to care provision requires collaboration among various members of the multidisciplinary care team with well-defined roles and responsibility for each member. In addition, financial risk-sharing strategies, such as bundled payments and capitated payments shared among different members of the care team, also incentivize increased collaboration for cost-efficient care.

How does this model work?

In an HMO setting, the provider is paid upfront at an agreed-upon fee to offer a range of services to the subscribers.

The agreed payment allows an HMO to offer lower premiums than other types of health insurance plans, while retaining a high quality of care from its network. There are low or no deductibles with an HMO. Instead, the organization charges an amount, known as a co-pay (co-payment), for each clinical visit, test, or prescription. Co-pays in HMOs are typically low, thereby minimizing out-of-pocket expenses and making HMO plans affordable for families and employers. That said, some out-of-network services, including emergency care and dialysis, can be covered under the HMO.

The model incentivizes the provider to focus more on prevention and wellness to reduce the treatment costs. In addition, there is a general trend with payers looking to shift more risk to providers. It is therefore of interest to the providers to focus on prevention, in order to keep patients well, rather than waiting till the disease is advanced leading to complications and higher costs.

Gatekeeping in an HMO model

As the subscriber must choose from a pool of 'in-network' providers, this becomes their first point of contact with the health system. They cannot see a specialist without a referral from their primary provider, ("gatekeeper") except services such as screening. Primary providers where possible, refer to specialists who are within the HMO coverage, so their services are covered under the HMO plan after co-pays are made. If a primary provider leaves the network, subscribers are notified and are required to choose another provider from within the HMO plan.

The proposed Hybrid (Mini) HMO model

Currently, health reimbursement in the Middle East is dominated by a DRG model that does not cover any preventative/screening services. Thus, HMO is a very new concept in the region. We envisage that it is much more realistic and pragmatic to pilot the HMO model targeting

a specific disease or a cohort of patients, and apply a phased approach to a wider roll out. The pilot will be an opportunity to test the new approach, learn from it, and refine the process as we move to make bigger changes.

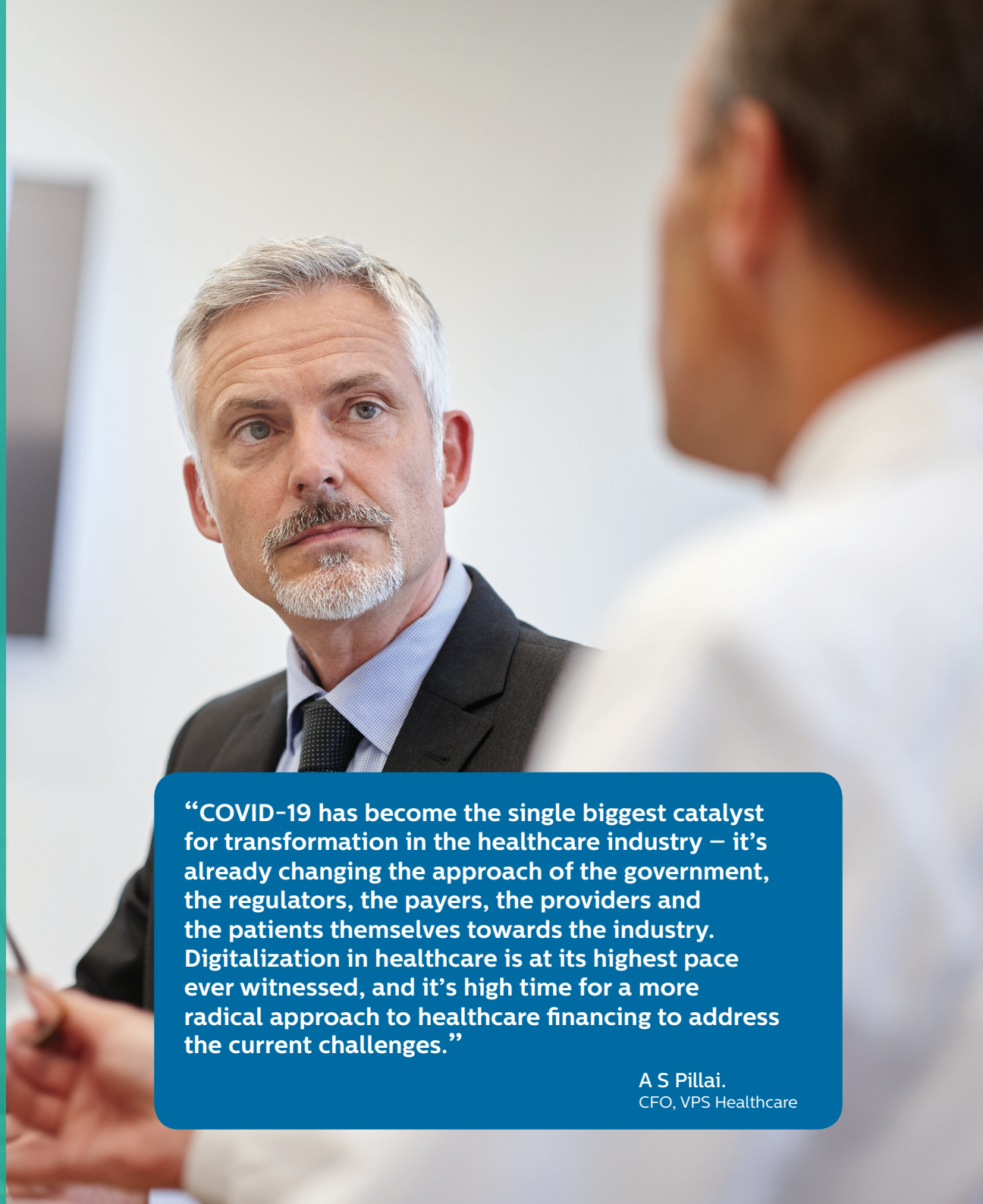
The proposed pilot

With the increasing incidence of chronic diseases and aging population, and that chronic disease management lends itself well to preventative approach, it is suggested that a community with a high incidence of the top 4 chronic diseases is selected as the basis for building the HMO model. The population is risk-stratified and payments (HMO payment to the provider, premiums and co-pays) are agreed based on the risk profile. From the regulators' perspective, such profiling would provider deeper insights to guide benchmarking and future health services planning. In addition, the pilot could be an opportunity to identify ways the plans could be made attractive to prospective subscribers.

Risks

Given that HMOs operate with a prepaid model, they must make predictions about future costs and revenue. Care must be taken not to underestimate incurred claims, overestimate the revenue, underprice the services provided, and make unrealistic expectations around ability to cost-shift.

In conclusion, COVID-19 has become the single biggest catalyst for transformation in the healthcare industry. It's already changing the approach of the government, the regulators, the payers, the providers and the patients themselves towards the industry. Digitalization in healthcare is at its fastest pace ever witnessed, and it's high time for a more radical approach to healthcare financing to address the current challenges.



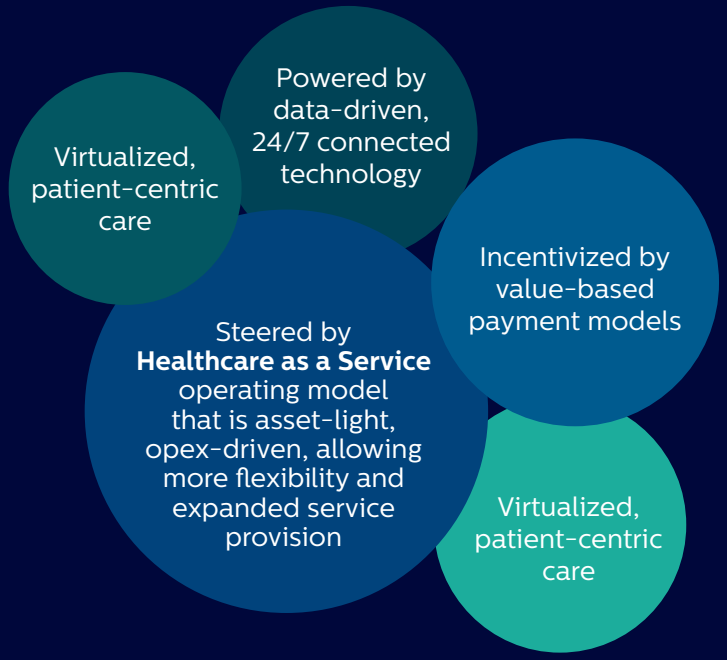
"COVID-19 has become the single biggest catalyst for transformation in the healthcare industry – it's already changing the approach of the government, the regulators, the payers, the providers and the patients themselves towards the industry. Digitalization in healthcare is at its highest pace ever witnessed, and it's high time for a more radical approach to healthcare financing to address the current challenges."

A S Pillai.
CFO, VPS Healthcare

7 The Way Forward

In conclusion, the COVID-19 pandemic has become the defining global health crisis of our time and the greatest public health challenge we have faced since the World War II. Despite its massive onslaught on the health sector, one positive outcome of the COVID-19 pandemic could be the prospect and hope of a much-improved healthcare system for the future.

This White Paper envisions a future driven by five trends:



Thus, going forward, telemedicine will feature very strongly in care delivery models. Contact-less patient interaction is likely to become the norm, rather than the exception. Care won't be limited by physical structures or by geographical borders. With new technology, patients will have more information and knowledge about their medical conditions and will be empowered to take an active role in controlling and maintaining their health and wellness. At the same time, patients would have higher expectations from the healthcare providers and would seek services that provide true value by solving their problems. This would influence the payers in developing new reimbursement models, based on the concept of Value based payments.

A digital ecosystem that connects the providers and the patients and make the information flow across boundaries and borders will be crucial to bringing this vision to life. This will range from person-enabled care (e.g. wearables) to interoperability solutions regulated by standardization and governance and operated by skilled workforce.

Such a borderless, digitized future landscape provides a perfect backdrop for **Healthcare as a Service** operating model to flourish, as it would allow multiple parties (like Philips, VPS and others) to co-develop holistic solutions and services that add real value for patients, regulators and payers. The parties could jointly establish dedicated companies to offer those solutions to 3rd parties - à la carte of services, e.g. clinical, technological, administrative or financial, to public and private sectors via subscription-based or pay-per-use frameworks.

This White Paper posits six solutions that would lend themselves perfectly to the **Healthcare as a Service** model: Teleradiology, Remote Patient Monitoring, Command Center, Tele Critical Care, Retail Health and Healthcare Financing. This is not an exhaustive list; however, based on our understanding of emerging trends and Philips-VPS core area of expertise, we see these solutions as forerunners as we embark into the exciting future.

Leveraging telehealth, improving supply chains, and creating more efficient and effective care ecosystems are among the many lessons of the COVID-19 pandemic. Now is the time to turn those lessons into action and re-imagine, re-engineer, and rebuild our health care system to deliver safe, effective, and high-quality affordable care for our patients and communities. We must not waste the opportunity this crisis presents.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