



SHAPING OUR POST-COVID WORLD



**Building a legacy
for a healthy society**

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In this instalment of the ‘Shaping our post-COVID world’ series, we examine how the construction industry can respond to the challenges facing the healthcare sector and why building a legacy of investment must be part of our collective ambition. For an industry that historically has been regarded as archaic, we now have an opportunity to harness our capabilities to be a force for positive change.

The COVID-19 pandemic is unlike any other crisis that we have faced in generations. It has wreaked human and economic havoc of an unprecedented global magnitude, yet recovery goes beyond the immediate response to the virus. At the heart of the word ‘recovery’ lies an inherent acknowledgement that people have a right to lead happy and healthy lives.

How can we debate the path to sustainable economic growth without staunchly focusing on human capital and the investment in people and their health? You cannot achieve one without the other. What this means for our industry is clear: to create healthy, resilient societies for the future, the legacy of what we build must produce healthcare that stands the test of time.ⁱ

An influx of investment in health

The coronavirus pandemic accelerated an already growing need for global healthcare spending. In many parts of the world, the virus brought to light long-standing pressures on healthcare systems, such as overcrowding and a neglect of primary care. Countries with ill-prepared health services were thrust into the spotlight, and a huge amount of investment poured into this sector, both to serve the immediate outbreak and to create vital, permanent infrastructure for the future.

Expenditure on South Africa’s public and private healthcare totalled more than R400bn in 2019, which enabled the government to massively increase the country’s short-term care capacity during the pandemic. As in many other parts of the world, COVID-19 brought the healthcare system and its capacity to respond effectively to the health crisis to the foreground.ⁱⁱ

A snapshot from Australia reveals that the government committed a record AUS\$115.5 billion for 2020–21 and a four-year investment of AUS\$467 billion (up AUS\$32 billion over last year’s budget) to deliver essential health services to Australians under the Long Term National Health Plan.ⁱⁱⁱ

For the global pharma sector, large research and development (R&D) budgets provided the financial flexibility to attack the outbreak. In 2019, the pharmaceutical industry spent a staggering \$186 billion on their search for new drugs, diagnostics and vaccines, around \$5 billion more than the previous year.^{iv} That same year, annual R&D spending in the UK’s pharmaceutical sector climbed to an

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eight-year high of £4.8 bn from £4.5 bn the year before.^v By 2026, global spending is predicted to reach more than \$230 billion.^{vi}

The race to discover effective treatments and vaccines for COVID-19 has created an opportunity for the biopharma industry to demonstrate its value, but it has also presented potential short- and long-term challenges.^{vii}

Healthcare systems have had to adapt to a surging number of critically ill patients, and governments have been forced to redirect healthcare staff, hospital beds and laboratories to the COVID-19 response. In the effort to develop treatments and vaccines, life sciences companies have had to delay clinical trials of therapeutics for other illnesses, as budgets and resources were diverted to COVID-19 products.^{viii} This shift in focus is having a severe impact on project timelines.

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The triple challenge of productivity, capacity and flexibility

The common denominator between healthcare, pharma and life sciences projects is always speed to market. As an industry we must understand how we can reflect that challenge in how we can deliver and operate the built environment to enable that speed. Delivering projects on-time, with quality and to regulatory standards, takes on a new meaning when it's seen in the context of improving patient outcomes, whether we are building hospitals, research labs or manufacturing plants.

Productivity

It's becoming increasingly important for healthcare systems to deliver quality patient care with increased productivity. The harrowing image of a hectic hospital ward where nurses are scrambling for time with their patients is now all too familiar. Achieving more for the same level of effort should be front and centre of policymakers' minds.

In the U.S., 18% of gross domestic product is spent on healthcare, compared to an OECD average of 8.8%, yet the system often fails to deliver high-quality, affordable and convenient services to patients. Improving productivity in healthcare delivery could change this dynamic, but it could only be realised through meaningful action and collaboration among all stakeholders.^{ix}

Capacity

Capacity is another key element of the challenge to achieve timely delivery of healthcare. To have enough hospitals, clinics and trained healthcare professionals in place, with the right equipment, working efficiently is crucial for providing the best chance of successful treatment.^x Build out of alternate hospital capacity is seen as a key action for increasing critical care capacity during COVID-19.^{xi} Without capacity, lives are lost.

In hospitals, mobile or temporary modular units are already seen as a valuable extension of permanent estates and facilities. This type of flexible infrastructure allows hospitals to plan their changes better to provide uninterrupted care for patients in a complex situation that is changing daily.^{xii}

Still, healthcare planners face a tremendous challenge in planning capacity to treat non-COVID-19 conditions whilst maintaining the ability to respond to an increase in cases.^{xiii}

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Health policymakers will need to plan for a backlog of unmet need, alongside ensuring treatment for the millions of people currently waiting for routine elective care.

Flexibility

Flexibility in the design of a healthcare facility is a key aspect of the build environment that also directly impacts patients and end-users. When buildings are designed from scratch over and over again, they require a lot of on-site construction time and complexity. Feedback from the people occupying the space can't be incorporated to make improvements into the next iteration of the design.

Hospitals require different spatial needs at an increasingly rapid rate. Most of the hospital stock in the U.S. was built in the decades following World War II, as a result of the 1946 Hill-Burton Act which boosted national investment into healthcare. The programme eventually fed into its successor, the larger

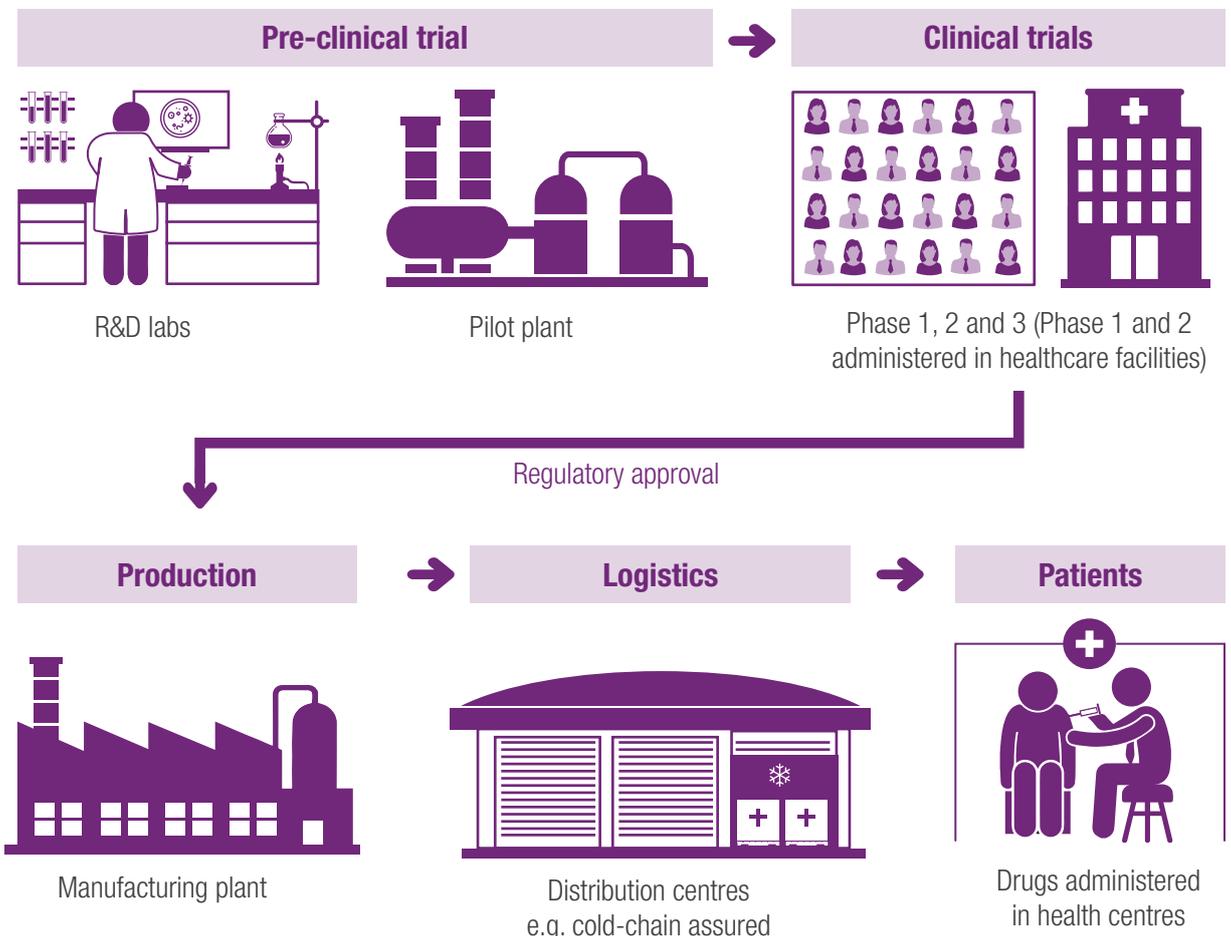
Public Health Service Act, in the 1970s. By 1997 nearly 7,000 health care facilities, including hospitals, rehabilitation centres, and clinics, had been constructed with subsidies from either the Hill-Burton program or the Public Health Service Act. Clearly the architects of mid-1900's hospitals could not have anticipated today's medical technology.^{xiv}

Advancements in innovation and technical developments in healthcare are calling for a flexibility in hospital design that enables the building to adapt quickly to changing functional needs.^{xv} Outdated buildings cannot meet the needs of an ever-transforming society and they could hamper future medical innovations.

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Building better, for better outcomes

It is clear that how we deliver and operate the built environment impacts the entire development process for drugs, medical treatments and vaccines. In a vaccination programme, from high quality, clean R&D labs and pilot plants that house the scientists working on pre-clinical trials, to the hospitals catering to volunteers in Phase 1 clinical trials, through to manufacturing plants and distribution warehouses, the buildings play a key role in how products are delivered to patients.



With the COVID-19 pandemic changing the world, the construction industry can respond to the challenges facing the healthcare sector and take a fresh approach to project delivery with innovation and speed to market at its core. We have the tools, the knowledge and the ability to make a difference, but if we don't change how we build, we can't improve outcomes for patients and societies.

Modern methods of construction are unquestionably crucial for ensuring a legacy for the investment in healthcare. At Mace, this term implies a major shift in construction delivery that will take us from 'construction to production.' As a philosophy, it is a huge step-change approach to project delivery of particular relevance in today's world where project timelines must be minimised.

A delivery model grounded on a digital agenda and construction to production philosophy enables more and more off-site manufacturing and pre-commissioning of the components that make up the vital healthcare facilities, thus bringing greater foresight, certainty and consistency to project delivery.

Key recommendations

Early investment in modular construction approaches

For governments investing in new healthcare facilities or extensive upgrade programmes of existing facilities; and pharma organisations working with exceedingly tight timelines, modularisation on a large scale becomes not just the preferred method, but the only method to meet demands. Thanks to the 'construction to production' vision, large facilities that wouldn't normally lend themselves to modularisation can now be preassembled in thousands of distinct units at a separate location, in a matter of months.

The secret to success lies in considering the modularised concept at the beginning of the design stage. When time, remoteness or local restraints mean modularisation is the right solution, a modularised approach or a hybrid mix of traditional and modular build can yield incredible time-savings.

Adopting BIM and digital design across the project lifecycle

'Construction to production' goes hand in hand with the adoption of digital technology such as Building Information Modeling (BIM), which integrates with the supply chain and supports the project from the design phase through to build and operations.

As a digital platform, BIM brings the various development components together across the scope of the project to improve accuracy and efficiency. BIM enables greater cost certainty, team communication and collaboration on site and sets out the rules early in the project phase. The adoption of lean, 'real-time' digital workflows in construction management leads to significant cost savings across the entire project lifecycle through increasing productivity and eliminating costly re-work. Thanks to the digital replica of the building that can be created through BIM, there is a common thread of data throughout the project lifecycle from design through to operations.

Building integrated delivery teams

The offsite manufacturing and adoption of BIM technology fit seamlessly with an integrated team approach. Hospitals and pharmaceutical facilities are complex projects and there is a soaring global demand that can cause delays. To support dynamic and effective decision-making, we need a well-governed, transparent and collaborative delivery model. Engaging and integrating the best supply chain partners at an early stage provides the innovation, solutions and flexibility required for success.

The investment in capital (often in obscure locations) has a direct impact on procurement, time and cost of the project delivery. With fresh-thinking applied to the procurement process and the integration of the project team and supply chain, there will be collaboration towards a common goal of quality and reduced timelines. We also need to look at procurement of agile teams who are capable of mobilising quickly, empowered with the ability to make decisions. This was a game-changer on the rapid roll out of the NHS Nightingale hospital in London during the first wave of the pandemic.

As the COVID-19 vaccine emerged, the global waiting game began. While physical movement is temporarily on hold in many parts of the world, the demand for healthcare is only intensifying. A growing population will add more pressure on the healthcare infrastructure and governments will need to reconsider their current investments to ensure that hospitals can rapidly escalate capacity when another pandemic emerges in the future.^{xvi} Now the construction industry has a clear role to play in delivering these life-saving treatments and facilities. The window of opportunity to step up, embrace a new delivery model and leave a legacy for lasting change is wide open.

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