

Care closer to home has long been the mantra of a health service looking to deliver improved outcomes for patients while simultaneously saving money by shifting services from large tertiary hospitals into the community. But with fewer resources, rising consumer expectation and advancing technology, **Dr Michelle Tempest** and **Dr Joe Taylor**, Candestic, examine how new models of care are emerging that are enabling care to be shifted closer to the individual



The **consumer** has **landed**

This year marks the fiftieth anniversary of the Apollo moon landing. NASA's great success stemmed from the inaugural address given in 1961 by President John F. Kennedy, when he spoke the famous 'ask not what your country can do for you - ask what you can do for your country'. During his leadership, scientists were inspired to dream big. And health technologies from digital breast biopsy to shuttle insulating foam used in artificial limbs spun out of the space race.

Today, the greatest challenge for mankind is that people are living longer with more long-term conditions, yet there are not enough human care staff to go around. We now must ask 'not what others can do for your health - but what we all do to democratise health?'

In this article, we focus on three global trends: the consumer revolution; workforce streamlining, and home testing and monitoring.

The rise of the 'consumer customer'

Healthcare has been slow to catch up in the consumerisation tsunami. The internet unleashed an information revolution back in the 1990s. It changed retail, banking and even dating.

A recent poll showed the radical rise of digital matches - more couples now meet online than through friends, work, college or family.

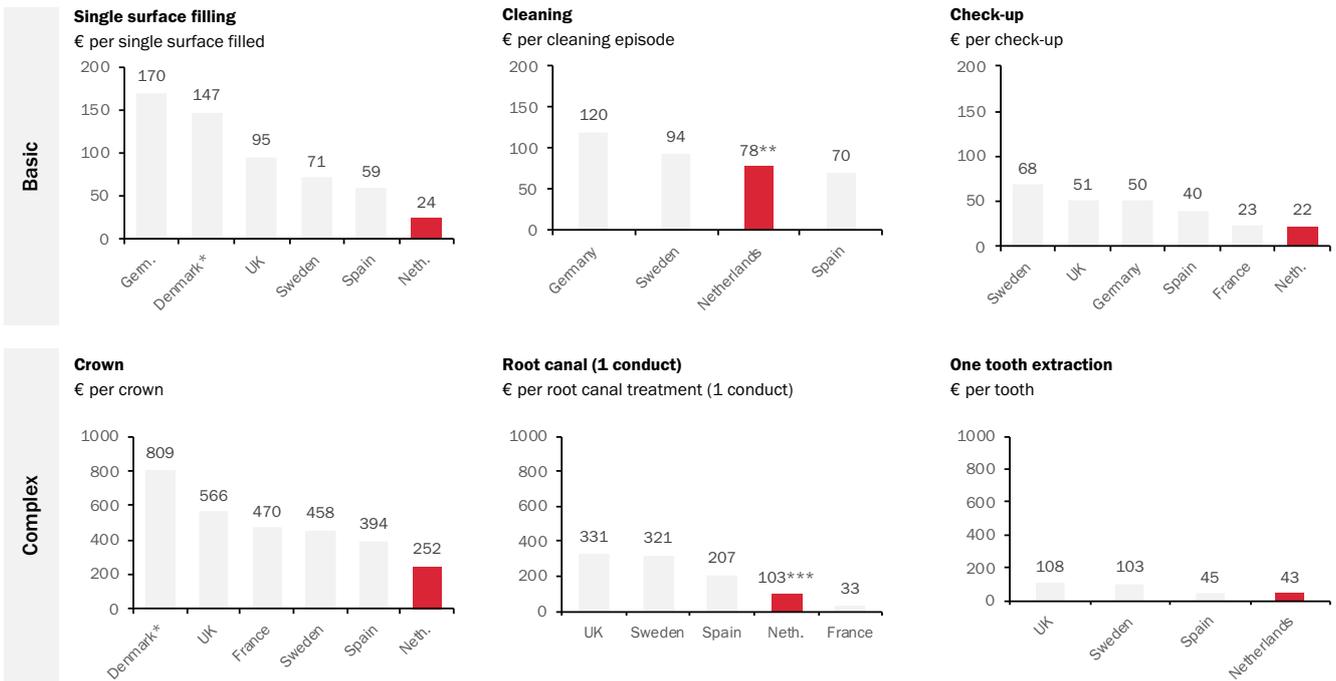
In healthcare, the exponential digital shift has finally arrived, and we're

increasingly using it to find our perfect match within the complex web of care providers. Websites, such as WebMD, have mushroomed and Amazon recently announced that its smart-speaker, Alexa, will add healthcare capabilities to its service range. In response to voice activation, the smart-speaker will offer spoken advice from the NHS Choices website.

Professor Helen Stokes-Lampard, chairwoman of the Royal College of GPs, released a statement praising the partnership, stating 'it has the potential to help some patients work out what care they need before considering whether to seek face-to-face medical help'.

Clearly, there are limits to Alexa's capabilities as a health advisor, however, this healthcare gate-keeping could

FIGURE ONE
DUTCH DENTAL PRICE POINTS ARE SOME OF THE LOWEST IN EUROPE



NOTES * DENTAL TREATMENT PRICES IN GERMANY ARE FIXED FOR GIVEN PROCEDURES; ** CALCULATED WITH 5 MIN TARIFF X 30 MIN (AV. TIME); *** ONLY PROVIDED FOR NON-COMPLICATED CASES
SOURCE GACETA DENTAL; TANDARTS.NL; DEUTSCH FAMILIENVERSICHERUNG; COMPANY WEBSITES; CANDESCIC INTERVIEWS; CANDESCIC ANALYSIS

potentially pave the way for other digital capabilities, such as NHS appointment booking by voice command. Plus, there are already well-known home triage and primary care apps such as Ada, eConsult, Livi, AllDayDr, Doctor Care Anywhere and Babylon, to name a few.

Upskilling the workforce pyramid

The global health and social care staffing crisis rumbles on as more people exit or retire than are recruited and retained. It's clear that the redistribution of tasks is inevitable. This long term trend has been present in hospital settings for decades - for example, phlebotomists replaced doctors in taking blood samples.

We recently examined the Dutch dentistry market where over the next decade, preventive treatments are projected to grow at 5% a year compared to complex dentistry treatments at 1% a year.

This growth is set within an impending dentist retirement bubble and, as a result, the care model is shifting towards preventive treatments being delegated to assistant staff, keeping price points competitive in comparison to other European countries (Figure One).

Similar upskilling down the staffing

pyramid can be seen right across health and social care settings.

Indeed, this trend in enabling lesser skilled staff to handle the increasing workload generated by an aging population and is key to enabling healthcare systems to survive the onslaught of demand rises against the backdrop of limited funding.

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Bringing testing home

There is a proliferation in diagnostic testing kits posted to people at home or work.

Blood and other biological materials have traditionally been collected in formal care environments. Improved diagnostic technologies use smaller samples and can be analysed and, more importantly, collected at lower cost. This has enabled the convenience of at home collection and postage for analysis in central laboratories.

Diagnostic start-ups have created a new market of health testing at home. Thruva, Medicecks and Forth are examples of recent entrants to the diagnostics market (Figure Two). Their focus is on providing screening for people without symptoms of a nature that would cause recourse to a clinician. There is not yet an evidence base for health impacts of widespread self-selected screening, but the promise is there.

Some clinicians have expressed concern that it may drive unnecessary consultations from people with clinically irrelevant aberrant results. However, it is unclear if this will be mitigated by the potential to catch problems in patients that would normally be missed by the system.

The falling costs of genomic screening resulted in the emergence of 23andMe,

FIGURE TWO
EXAMPLES OF COMPANIES OFFERING HOME BLOOD TESTING KITS

Company	Description
 thriva	<ul style="list-style-type: none"> • Thriva is a UK based mail order diagnostics company, • Thriva offer three screening packages in a subscription based-model in which tests are repeated every 3 months.
 FORTH	<ul style="list-style-type: none"> • Forth is a UK based mail order diagnostics company, • The company offers a range of screens, from specific hormones to comprehensive biomarker tests.
 medichecks	<ul style="list-style-type: none"> • Medichecks is a UK based mail order diagnostics company specializing in blood tests, • Medichecks offers a range of health check packages, as well as individual tests.
 LiveSmart	<ul style="list-style-type: none"> • LiveSmart offers a range of health assessments monitoring standard blood screens and hormones, • Main focus is on B2B sales.
 vitl	<ul style="list-style-type: none"> • Vitl offers at home kits for blood tests, as well as a DNA saliva test and personalized multivitamins,
 DNAfit	<ul style="list-style-type: none"> • DNAfit offers mainly DNA saliva tests, but offers blood testing in an add-on SnapShot service.
 YORKTEST LABORATORIES	<ul style="list-style-type: none"> • YorkTest offers food intolerance tests, as well as allergy, diabetes and liver checks.
 Royal Devon and Exeter NHS Foundation Trust	<ul style="list-style-type: none"> • The Royal Devon and Exeter NHS Foundation Trust has opened a private blood testing service, • The service offers only a narrow range of tests, including cholesterol, diabetes, thyroid and vit D monitoring.

SOURCE COMPANY WEBSITES; ORBIS; CANDESIC INTERVIEWS; CANDESIC ANALYSIS

which faced a rocky regulatory ride before finding a model that enabled people to post off samples to find their genetic backgrounds. DNAfit is a similar model, but with a focus on identifying genetic markers to guide people’s exercise plans, diets and lifestyle choices.

Newer ‘Next Generation Sequencing’ technologies, which map your entire genome are becoming increasingly affordable, enabling you to test ‘once and for all’ unlike 23andme, which upgrades its chips to map more genes every couple of years. Dante Labs is a European player offering full genome mapping for €599.

As our understanding of the human genome evolves, it is likely that more people will consider knowledge of their full genome as an essential tool in making decisions throughout their lives.

The NHS is also getting in on the act. We already have STI sample collection kits posted out by the NHS, provided by companies such as Prevent X.

There are signs the NHS is entering the private space too. The Royal Devon and Exeter NHS Foundation Trust has opened a private blood testing service, directly comparable to home testing kits such as those offered by Thriva, Medichecks and Forth.

The service offers only a narrow range of tests, priced between £24 and £47, for which customers collect their own

samples at home and send them off to be analysed in the trust’s own laboratory. The idea has come under scrutiny from those who are against services that stray from the NHS ‘free at the point of care’ model, as well as those who object to widespread healthcare screening in general.

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However, it is likely that screening at home will continue to be a growing market for the private sector and a potential source of income for the small number of NHS trusts willing to take the leap into customer driven healthcare.

Home monitoring

Monitoring and tracking devices in the home are all part of the ‘internet of things’ (IoT) that help create smart homes and smart cities. Many devices detect change in sound, light or images and innovation is fast moving into the healthcare setting from other disciplines (Figure Three).

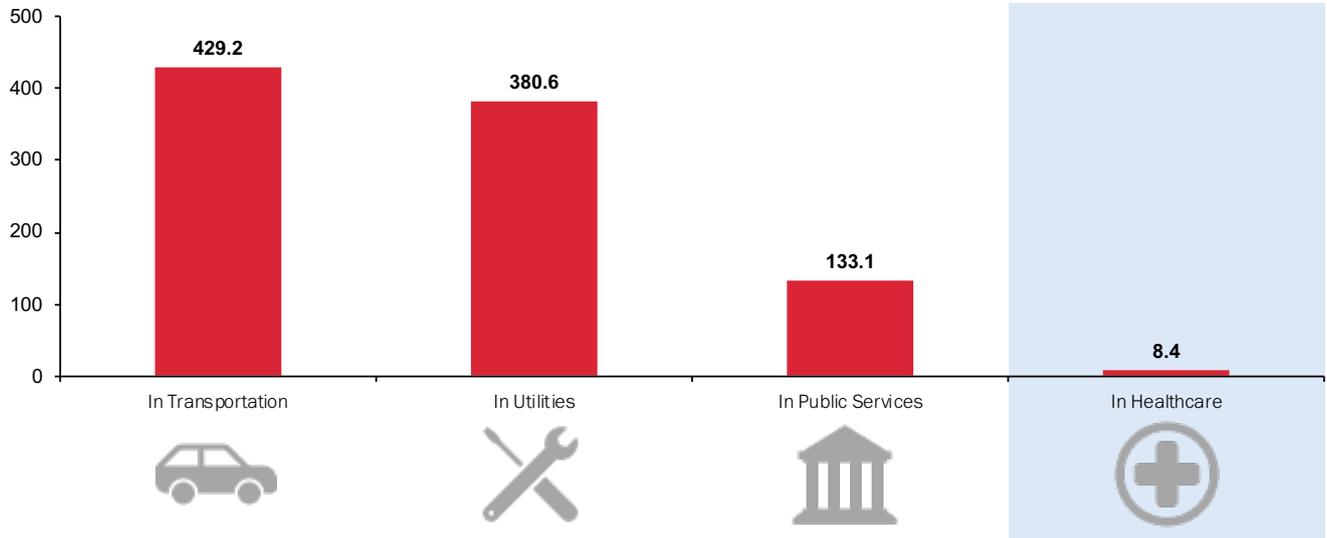
Mobile health, therapeutic apps, health trackers and ‘digiceuticals’ are connecting and collating data to create the ‘digital twin’.

The marriage of healthcare, AI and the Cloud allows for immediate feedback – although when the British government announced it was toying with the idea of offering sleep hygiene advice, it was not a popular policy!

Overall, healthcare consumers are updating their expectations – wanting immediate care tailored to their needs. Personalised smart inhaler technology is already on our streets and in our pockets. Propeller Health has created a sensor that attaches to an inhaler or

FIGURE THREE
IoT INNOVATION PLATFORMS ARE SLOWLY COMING TO HEALTHCARE

Connected devices installed in smart cities, 2017
Millions



SOURCE SMART AND RESILIENT CITIES

bluetooth spirometer. It connects to an app and helps people with asthma and Chronic Obstructive Pulmonary Disease (COPD), which includes emphysema and chronic bronchitis, understand what might be causing their symptoms and track medication use as well as provide allergen forecasts.

Other companies are making disposable spirometer, which connects to a mobile phone, further lowering the price of 'patient' use devices.

The fragmented monitoring market is crammed full of global start-ups and an ever increasing number of investors jumping into the healthcare market for the first time. It's hoped that by putting the consumer at the epicentre - success will be driven by disruptors.

The sector craves a dynamic shift to offer a more integrated and holistic care model.

New NHS care model

The new 'NHS models of care' are also aiming to deliver more care at home by entering into collaborative 'alliance agreement' within integrated care systems (ICSs). The member organisations of an ICS gain new powers and freedoms to plan how best to provide care for their area. So far, 14 ICSs have been created in England, with every corner of the

country expected to be covered by 2022. Going forward, NHS England visualises ICSs as the best way to integrate physical health provision with mental health provision, hospital services with community services, and health with social care.

Our communal challenge

The great healthcare challenge that we are facing should not be underestimated, but our ability to innovate in tackling it should not be either. As we develop new ways of handing back the keys to care and wellbeing to each person, we will be

able to deploy our healthcare professionals more efficiently.

The future of healthcare will have to be much like its history, people caring for themselves and each other where they can, and calling on professionals when they are most in need.

Brilliant science enabled us to land on the moon fifty years ago, even more amazing science enabled people who watched the moon landing to celebrate its anniversary this year. Let's work together to make another great leap to revolutionise how people get their care.



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