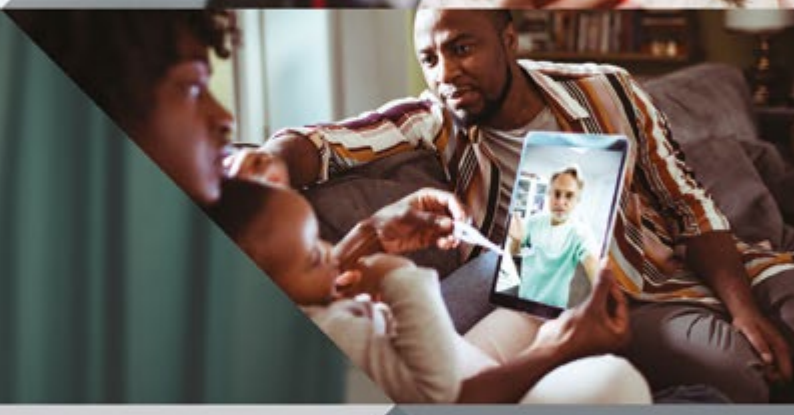
CLINICIAN OF THE FUTURE

REPORT
2022



ELSEVIER
Health

Clinician of the Future

Contents

Foreword 3

Summary 4

Introduction 8

Chapter 1: The Future Clinician as a Partner for Health 11

Chapter 2: The Future "Total Health" Clinician 35

Chapter 3: The Future Tech-Savvy Clinician 51

Chapter 4: The Future Balanced Clinician 73

Chapter 5: The Future Accessible Clinician 92

Conclusion 108

Methodology 109

Acknowledgments 113

Appendices 115

Clinician of the Future

Foreword

The pace of change in healthcare is accelerating around the world. Global healthcare is on the path to a fundamental shift away from focusing on illness towards a total health, patient-centered, digital approach to wellbeing. Doctors and nurses working in healthcare systems around the world are changing the way they learn and work, the way they understand health and the way they collaborate with patients.

Elsevier Health conducted the Clinician of the Future study in partnership with Ipsos to hear directly from doctors and nurses, to shed light on the challenges and trends they are facing, and to identify the ways we can support them now and in the future. Our aims included listening to their experiences, helping give voice to their concerns and importantly, where we can, acting on the issues and opportunities they have told us.

At Elsevier we have supported clinicians for more than a century by providing trusted, evidence-based content and clinical solutions. Today, our global Health organization supports students, educators, librarians and healthcare professionals in advancing science and improving health outcomes through information, decision tools and analytics.

In this report, you will gain meaningful insights from thousands of doctors and nurses around the world, as well as experts and key opinion leaders in the USA, UK and China. They have shared with us the many changes impacting their work and the key areas that they require greater support and advancement in, among them data analytics, digital health technologies and improving empathy and communications with patients. We thank them sincerely for participating in this study and sharing their invaluable perspectives.

We are committed to working closely with them, as well as with educational institutions, medical societies, and healthcare organizations to build a roadmap that strengthens critical skills on the use of health data and digital technologies and enables doctors and nurses to be better prepared for the changes expected in healthcare. Collectively we have an opportunity to empower clinicians at every phase of their educational and professional journey with the right skills and they can use to advance patient care.

By working together with doctors and nurses to understand what they will need in the future, Elsevier Health can continue to fulfil its role and support the medical community, ultimately helping to reach the goal we all share: to improve every patient outcome.

Sincerely,

Jan Herzhoff

President, Elsevier Health

Clinician of the Future

Summary

The clinician of the future, like today's clinician, will be knowledgeable and skilled across a range of competencies, from clinical to digital. But the way clinicians work and the demands on them are likely to look different in the future.

Elsevier Health developed the Clinician of the Future study and global report to explore trends and changes that will impact the future of healthcare – and therefore shape the clinician of the future.

On the basis of a series of interviews, a large-scale global survey and roundtable discussions with key opinion leaders and students, we have pictured the clinician of the future from five perspectives, highlighting different aspects of their roles and the healthcare systems in which they might be working in 10 years' time. Each of the five essays in the report looks at the clinician of the future from a different angle; the future clinician will most likely encompass all of these projections with some having a stronger focus in certain areas.

The Future Clinician as a Partner for Health

For details, see Chapter 1 on page 11

In the Clinician of the Future survey, more than half of clinicians around the world (56%) agreed patients have become more empowered to manage their own conditions over the last decade. Despite the increase in the use of technology and remote consulting, 82% of clinicians agreed that soft skills such as listening and being empathetic have become increasingly important among clinicians in the last decade. Clinicians also shared that they are pressed for time: only half (51%) of clinicians agreed the amount of time they are able to spend with patients is sufficient to give them good care.

Drivers of change

- More informed patients: in the survey, 86% of clinicians agreed the rise of patients informed about their health conditions is driving healthcare change
- Patient-consumers: 90% of clinicians who responded to the survey agreed that quality measures, including patient satisfaction, have driven change in healthcare in the last decade

The decade ahead – key findings from the Clinician of the Future study

- 62% of clinicians agreed the role of the clinician will change to be more of a partnership with the patient in 10 years' time
- 51% of clinicians agreed telehealth will negatively impact their ability to demonstrate empathy with patients
- 56% agreed patients will be more empowered to take care of their own health
- 77% of clinicians expect real-time patient analytics to be critical to personalized care in the future
- 43% expect every individual will have their genome sequenced to support illness prevention

The clinician of the future

Working in partnership with their patients, the clinician of the future is adept at utilizing health data and advanced clinical insights to make informed decisions. They communicate with patients in a variety of ways, from limited virtual check-ins to in-person consultations at patients' homes. Clinicians' patients have much greater control over their own medical records and health data. To keep up with the latest developments, the clinician of the future has more dedicated time set aside to learn and embrace new digital approaches.

The Future "Total Health" Clinician

For details, see Chapter 2 on page 35

Clinicians believe governmental policies are important: in the Clinician of the Future survey, 89% of respondents agreed policies are a key driver of change. But few believe that the government priorities on healthcare are the right ones – only 42% of respondents agreed. They believe change is needed – 79% agreed there is not enough being done on preventive care. There are different approaches taken to managing health around the world, from universal healthcare to private systems, and finance was a broad concern globally: 68% of survey respondents agreed there is too much focus on cost rather than care; agreement was particularly high in North America (82%) and Europe (74%).

Drivers of change

- Population growth and aging: 93% identified the ageing population as a key driver of change, and 84% of clinicians believe patients with age-associated diseases will make up the majority of the patient population in 10 years
- Noncommunicable diseases: 71% of clinicians agreed there will be an increase in comorbidities among younger patients in 10 years
- Empowered patients: The move toward patient-centered care is driving a preventive approach

The decade ahead – key findings from the Clinician of the Future study

- 73% of clinicians globally identified that in 10 years' time managing public health will be a key priority in their role
- 56% of clinicians expect a much higher proportion of patients will attend regular mandated health check-ups in the future, rising to 80% in China
- Clinicians expect to work in a diverse expanded team, which not only reflect the local population (62% agree it will) but include experts such as data analysts
- Clinicians told us they believe there will be better alignment between all the stakeholders involved in the delivery of healthcare

The clinician of the future

The clinician of the future will get a head-start on health, taking a preventive approach and working with people to enable them to manage their own mental and physical health before they become ill – including through regular checkups. This will be helpful given the growing patient population, as the rate of non-communicable diseases (NCDs) rises and the population ages. The clinicians' education will have been focused not just on clinical knowledge and transferrable skills like communication, but also on leadership, finance management and data science. With a broader view of the healthcare system and a role in policy, the clinician will be shaping care and focused on health span not life span. They work in the healthcare setting and beyond, as part of an interdisciplinary team. As they are financially incentivized to promote patients' health through value-based care rather than treat their disease, cost has less of an impact on their decision making. They work within an integrated healthcare system that focuses on prevention.

The Future Tech-Savvy Clinician

For details, see Chapter 3 on page 51

Today's clinicians are already using technology in their day-to-day work: in the Clinician of the Future survey, 88% of respondents agreed that being technologically savvy is more important in a clinician's daily role today than it was a decade ago. But the rise of digital technology and amount of data are taking a toll: 69% of clinicians agreed that the volume of patient data is overwhelming. In the interviews and roundtables held as part of the Clinician of the Future study, clinicians noted frustrations with the electronic medical record (EMR), which they believe are an administrative burden.

Drivers of change

- Big Data are getting bigger: the volume of data created, captured, copied and consumed globally is expected to reach 181 zettabytes in 2025[1]
- COVID-19 has accelerated tech: public interest in telehealth increased during the pandemic, according to an analysis of Google Trends™[2]

The decade ahead – key findings from the Clinician of the Future study

- 70% of clinicians agreed the widespread use of digital health technologies will enable the positive transformation of healthcare
- 63% expect most consultations to be remote in 10 years
- 69% of clinicians agreed digital health technologies will be a challenging burden
- 64% agreed the impact of health inequalities will be exacerbated by digital technology
- 56% of clinicians expect they will make most decisions using clinical decision support tools that use artificial intelligence (AI) in 10 years' time

The clinician of the future

The clinician of the future works in a system that is dependent on digital technology, and positively transformed as a result. Day to day, most of their consultations are virtual, and they use interoperable digital health software to manage patent communication, maintain patient records and help them make clinical decisions. They have all the data they need at their fingertips, and tech that uses artificial intelligence to highlight the most relevant information. Although they need to keep up with fast-changing tech, and will be challenged by it, they will ensure they are able to maintain empathy in a digital setting.

The Future Balanced Clinician

For details, see Chapter 4 on page 73

Today's clinicians often report feeling overworked, overwhelmed and burned out. Full-time employed clinicians surveyed work 50 hours on average, and only 57% agreed they have a good work–life balance. Many feel their roles are changing for the worse: 71% of doctors in the USA and 66% in the UK agreed their roles have become worse in the last 10 years. They recognize that they need support: 26% of clinicians surveyed agreed wellbeing support is a top priority. Yet in spite of all of this they love what they do, in the survey, 85% of respondents agreed that they enjoy their jobs.

Drivers of change

- Changing roles: 63% of clinicians agreed the role of the doctor has changed considerably and 66% for the nurse's role
- Digital tech: 69% of clinicians agreed that the volume of patient data is already overwhelming
- COVID-19: 97% of clinicians agreed the pandemic is a key driver for change

The decade ahead – key findings from the Clinician of the Future study

- 74% of clinicians agreed there will be a shortage of nurses and 68% agreed there will be a shortage of doctors
- 41% of clinicians expect to be seen as less valuable to patients
- 69% of clinicians agreed digital health technologies will be a challenging burden

The clinician of the future

With global clinician shortages putting pressure on their time, the clinician of the future has a challenging workload. They love their job and their role is dynamic and engaging. When work pressure affects their mental wellbeing, they can lean on support systems – including digital technologies – provided by their employer, and they are part of peer support groups. They face a constant flow of new technologies and information to learn, and they are given the time to do this, to benefit patient care.

The Future Accessible Clinician

For details, see Chapter 5 on page 92

Today, health inequity affects people around the world. Social determinants of health are increasingly recognized and explored by clinicians, and one frustration that came through in the Clinician of the Future study was cost: 68% of survey respondents agreed there is too much focus on cost rather than care. Demographic and health changes mean more people are dealing with age-related diseases, non-communicable diseases and complex comorbidities. In the interviews and roundtables held as part of the study, clinicians also noted inequalities within the clinical team.

Drivers of change

- Chronic disease: 94% of clinicians agreed the rise of non-communicable disease is a key driver of change
- Inequity: 81% of clinicians considered health inequity to be driver of change in healthcare
- COVID-19 widened the health gap: 97% of clinicians agreed the pandemic is a key driver of change
- Empowered patients: Clinicians believe telehealth is improving access and digital tech is empowering patients

The decade ahead – key findings from the Clinician of the Future study

- 64% of clinicians agreed the impact of health inequalities will be exacerbated by the greater use of digital health
- 73% of clinicians globally identified that in 10 years' time managing public health will be a key priority within their role
- 49% of clinicians agreed the majority of healthcare will be provided in a patient's home in 10 years' time, and many expect greater equality at work

The clinician of the future

The clinician of the future will be part of a more equitable healthcare system, focused on ensuring everyone is able to live a long, healthy life. Their workplace extends from traditional settings to patients' homes and community centers, helping them reach vulnerable populations. They build strong relationships with their patients based on being a trusted partner, and they gather environmental as well as medical background information so they can identify services, such as digital access and monitoring tools, in addition to possible housing and financial aid to promote health. They support their patients to maintain their own health and provide information in a format they can understand. Their workplace is committed to equality and they are given ample time for continuous development, including on emerging digital technologies. They are concerned about health inequity, particularly the negative impacts of digital technology, and they advocate for policy that promotes access to health.

As this study has made clear, we are entering a period of change, which has been further accelerated by COVID-19. How healthcare is considered, managed and delivered will change considerably over the next decade. The models of caregiving will be different, data will become even more important, new technologies will develop, and patient empowerment and its transformative effect will mean new forms of engagement. While some of the changes could be disruptive, the clinician of the future will likely be working in a "total health" care system that is more efficient, fairer and supports empowered patients.

We want to keep listening to clinicians, and we invite you to share your thoughts and input with us.

elsevier.com/connect/clinician-of-the-future

Follow Elsevier Connect on Twitter, Facebook and LinkedIn

Clinician of the Future

Introduction

Healthcare is changing – and so are the clinicians at its core.

Healthcare is connected to almost every aspect of society and the economy. The focus is on keeping populations healthy, using the knowledge, tools and skills of highly trained clinicians to advance patient care.

However, what happens to those clinicians when society and technology change? When knowledge evolves and revolutionary technologies emerge, and when the people engaging with healthcare take on new roles?

That is what is happening now, and the COVID-19 pandemic has accelerated many of the changes we have seen emerge in recent years. As a result of these trends and changes, clinicians experience increasing pressures and challenges. To ensure they deliver the care required, clinicians must learn new skills, adapt their thinking and approaches, and work with their peers and patients in new ways.

Elsevier developed the Clinician of the Future global report to explore trends and changes that will impact the future of healthcare. This report presents the results of a series of interviews, a large-scale survey and roundtable discussions with key opinion leaders as a series of depictions of the clinician of the future. By understanding the drivers of change and what the next decade holds for clinicians, we can all be ready to support them. We considered it important to share what we have learned.

Meeting the clinician of today

Today's clinician is knowledgeable and skilled, empathetic and driven to help people, but they are burning out – and the added pressures of the ongoing COVID-19 pandemic are exacerbating an already difficult situation. Finance is a big issue in healthcare, in both private and public systems. Despite annual increases in global healthcare expenditure,[1] clinicians are often required to provide the best possible care for the lowest cost.

How do we define 'clinician'?

In this report, when we talk about 'clinicians' we are referring to physicians and nurses in primary and secondary care.

Although there have been steady increases in most regions in the last decade, there is still a global shortage of clinicians.[2,3] The aging population is one of the factors that is increasing the patient burden in healthcare: according to the World Health Organization (WHO), the proportion of the world's population over 60 years will nearly double from 12% to 22% between 2015 and 2050.[4]

Not everyone has equal access to the world's clinicians. According to the United Nations, data from 2013-2019[5] show there were more than ten times the number of clinicians per 10,000 people in North America compared to sub-Saharan Africa. The WHO estimates[6] we need an additional 18 million health workers to achieve universal healthcare in low and middle income countries by 2030 and 9 million more nurses and midwives to meet the global targets of Sustainable Development Goal (SDG) 3: Good Health and Well-Being.[7] Inequality is an issue within countries too – clinicians often struggle to provide the best care to the people in their own communities.

1 World Health Organization (WHO). Global expenditure on health: Public spending on the rise? 2021. https://apps.who.int/iris/bitstream/handle/10665/350560/9789240041219-eng.pdf

2 OECD. Health Statistics 2021. https://www.oecd.org/els/health-systems/health-data.htm

3 World Health Organization (WHO). Medical doctors (per 10 000 population). https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-(per-10-000-population)

4 World Health Organization (WHO). Ageing and health. 4 October 2021. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

5 United Nations Statistics Division (UNSD). Sustainable Development Goal 3 report 2021. https://unstats.un.org/sdgs/report/2021/goal-03/

6 World Health Organization (WHO). Health workforce. https://www.who.int/health-topics/health-workforce

7 United Nations (UN). Sustainable Development Goal 3. https://sdgs.un.org/goals/goal3

However, there are many positive trends already affecting clinicians. The number of medical and nursing students is increasing globally, which indicates a continued increase in the number of clinicians in the future. They are learning not only clinical knowledge but also soft skills like communication, and how to adapt those to changing contexts.

"The clinician's role has changed considerably"

Physician's role: 63% agreed

Nurse's role: 66% agreed

Figures are from the Clinician of the Future survey – for details see Chapter 4: The Future Balanced Clinician on page 73.

Technology is helping here – advances in digital tools put the information clinicians need to make good decisions at their fingertips. Armed with extensive data, clinicians can treat patients with a more personalized approach, and the emergence of precision medicine is set to drive this further.

These trends and more are already changing the role of the clinician, and thereby changing the support they will need to thrive in the future.

Envisioning the clinician of the future

To envision the future, first you need a deep understanding of the role of today's clinician, the challenges they face, and the trends and drivers of change. Considering all these factors together enables us to picture the future of healthcare. To do this, Elsevier Health collaborated with global market and opinion research specialist Ipsos on this report: *Clinician of the Future*.

With input from qualitative interviews, a quantitative survey and roundtables with key opinion leaders and students around the world, this report gathers the thoughts and experiences of healthcare professionals today and how they believe the profession will change in the future.

The study consisted of three phases. First, we conducted 23 in-depth interviews with clinicians in key markets. The results fed into the design of an online survey, which 2,838 clinicians completed. The findings from the first two phases provided discussion points for three regional roundtables with key opinion leaders and one with students.

The study aims:

- To understand the day-to-day lives of clinicians and the frustrations they feel
- To explore what is frustrating clinicians, and how any unmet needs or challenges could be overcome, through infrastructural changes and technology
- To identify and explore any trends that clinicians expect to disrupt healthcare in the future
- To understand how these changes may impact clinicians' roles in practice

You can read about the methodology in more detail on page 109.

This report brings together the perspectives of almost 3,000 clinicians around the world, helping establish a picture of the clinician of the future.

Explore this report

We look at the clinician of the future from five perspectives in this report. While we cannot predict exactly what challenges tomorrow's clinicians will face or how they will adapt to tackle them, the trends and drivers of change we explored in the study point to several likely outcomes. The clinician of the future will likely experience and incorporate aspects of all of them, so understanding each scenario will help clinicians and those supporting them prepare for the future.

Chapter 1: The Future Clinician as a Partner for Health

The clinician of the future will encounter the patient of the future: an informed, empowered member of their own care team. (see page 11).

Chapter 2: The Future "Total Health" Clinician

Our approach to medicine is transforming from being based on illness and disease to preventive healthcare, and the clinician of the future will help people stay healthy rather than waiting until they become ill. (see page 35)

Chapter 3: The Future Tech-Savvy Clinician

Underpinning every trend is the evolution of data and technology. The clinician of the future will use data and the latest tech to improve patient outcomes. (see page 51)

Chapter 4: The Future Balanced Clinician

Today's clinician is under-resourced and burning out as a result; the clinician of the future may have a better work–life balance if staff shortages are addressed. (see page 73)

Chapter 5: The Future Accessible Clinician

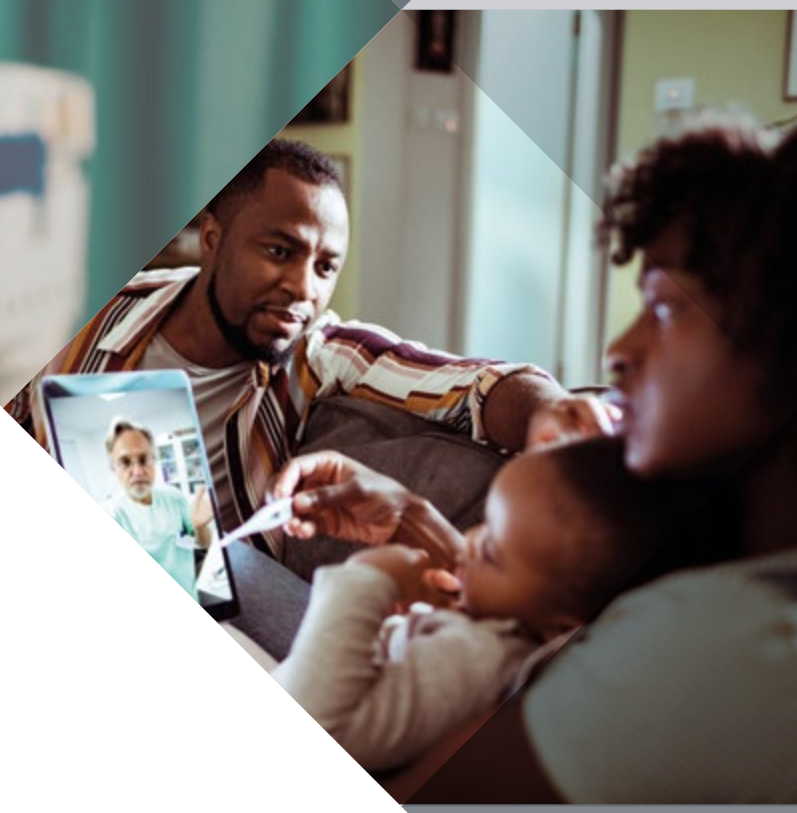
Clinicians face the challenge of being accessible, and the rise of digital health could exacerbate health inequity. (see page 92)

Join the discussion

This report and the study behind it mark the beginning of an ongoing discussion about the future of healthcare and what actions we all can take to ensure clinicians thrive in it. We welcome the opportunity to partner with you – stay in touch and join the conversation.

elsevier.com/connect/clinician-of-the-future

Follow Elsevier Connect on Twitter, Facebook and LinkedIn.



Clinician of the Future

Chapter 1

The Future Clinician as a Partner for Health

ELSEVIER

Health

Supporting the empowered patient

Meet the future clinician: a partner for health.

Working in partnership with their patients, the clinician of the future is adept at utilizing health data and advanced clinical insights to make informed decisions. They communicate with patients in a variety of ways, from limited virtual check-ins to in-person consultations at patients' homes. Patients have much greater control over and access to their own medical records and health data. To keep up with the latest developments to ensure the best patient experience, the clinician of the future has more dedicated time set aside to learn and embrace new digital approaches.

Today	Drivers of change	The future	Action
Patients are more empowered: More than half of clinicians around the world (**56%**) agreed patients have become more empowered to manage their own conditions over the last decade. **Empathy is important:** **82%** of clinicians agreed that soft skills like listening and being empathetic have become increasingly important among clinicians in the last decade. **Time is in short supply:** Only half (**51%**) of clinicians agreed the amount of time they are able to spend with patients is sufficient to give them good care.	**More informed patients:** **86%** of clinicians feel the rise of patients informed about their health conditions is driving healthcare change. **Patient-consumers:** **90%** of clinicians agreed that quality measures, including patient satisfaction, have driven change in healthcare in the last decade.	**Partnership with the patient:** **62%** of clinicians agreed the role of the clinician will change to be more of a partnership with the patient in 10 years' time, but **51%** of clinicians agreed telehealth will negatively impact their ability to demonstrate empathy with patients. **Patients will become even more empowered:** **56%** agree patients will be more empowered to take care of their own health; **41%** agreed they will be less valuable to patients than today. **Personalized care:** **77%** of clinicians expect real-time patient analytics to be critical to personalized care in the future, and **43%** expect every individual will have their genome sequenced to support illness prevention.	➤ Improve health literacy ➤ Focus on soft skills and hard data in the medical curriculum ➤ Support the move to digital with systems and infrastructure

Unless otherwise stated, the figures in this summary table are key findings from the Clinician of the Future survey, conducted with n=2838 clinicians.

Information, empowerment, and changing relationships

The relationships between clinicians and patients are changing. In the past, clinicians would be the source of medical information for patients, who would consult them with an illness or injury, relying on their expertise to treat them. As noted by Terrell in 2017, it remains the dominant view: "Although this paternalistic approach to health care is increasingly inadequate and irrelevant, it remains prevalent in the medical culture."[1]

While it continues to happen, there is a growing group of patients who are informed, health literate, and proactive about self-diagnosing before consulting a clinician for treatment.

Information asymmetry is a contributing factor for the current paradigm. Clinicians are highly trained – depending on location, a nursing degree can take 2-4 years, and medical school can be 4-6 years, followed by residency and fellowship – and they have extensive knowledge needed for analysis, diagnosis and treatment. Clinicians also have a complex web of information about the healthcare services and options available to their patients, and this affects their decisions, often without the patients knowing.[2]

In the past, patients didn't have access to medical information or to the background information affecting their clinicians' choices. They might have relied on knowledge passed down through the family or information they had read in books, but even with the more informed patients, there was a significant information asymmetry.

While the balance in clinical information asymmetry is shifting because many patients have access to the internet – and with it, much of the information clinicians have – there are challenges inherent to access. According to online symptom checker Symptomate, 72% of internet users look for health information online.[3] Clinicians welcome this, but many are concerned patients may misdiagnose their symptoms and potentially worsen their health, or that information that patients may not understand fully could cause unnecessary anxiety.

"There's a lot needed to help guide patients towards self-care and self-management. Therefore, there's a role for clinicians in shaping the digital tools to do that."

Dr Stan Shepherd, UK, who attended the Clinician of the Future UK roundtable.

People who want to delve into medicine can take basic classes at no cost; for example, the massive open online course provider Coursera lists more than 220 medical modules, all offered by top universities.[4] For those looking for quick answers, a simple Google search for a couple of symptoms can deliver millions of results in a split second, ranging from an in-depth WebMD page listing potential diagnoses and treatments to forums in which people share their stories. And there are already thousands of apps to help people identify their medical complaints.[5] In theory, if a patient can read and access the internet, they can self-diagnose.

The empowered patient

This is one of the building blocks of the empowered patient. In the Clinician of the Future survey, more than half of clinicians around the world (56%) agreed patients have become more empowered to manage their own conditions over the last decade, with this higher (63%) among US doctors.

Statement: Patients have become more empowered to manage their own conditions

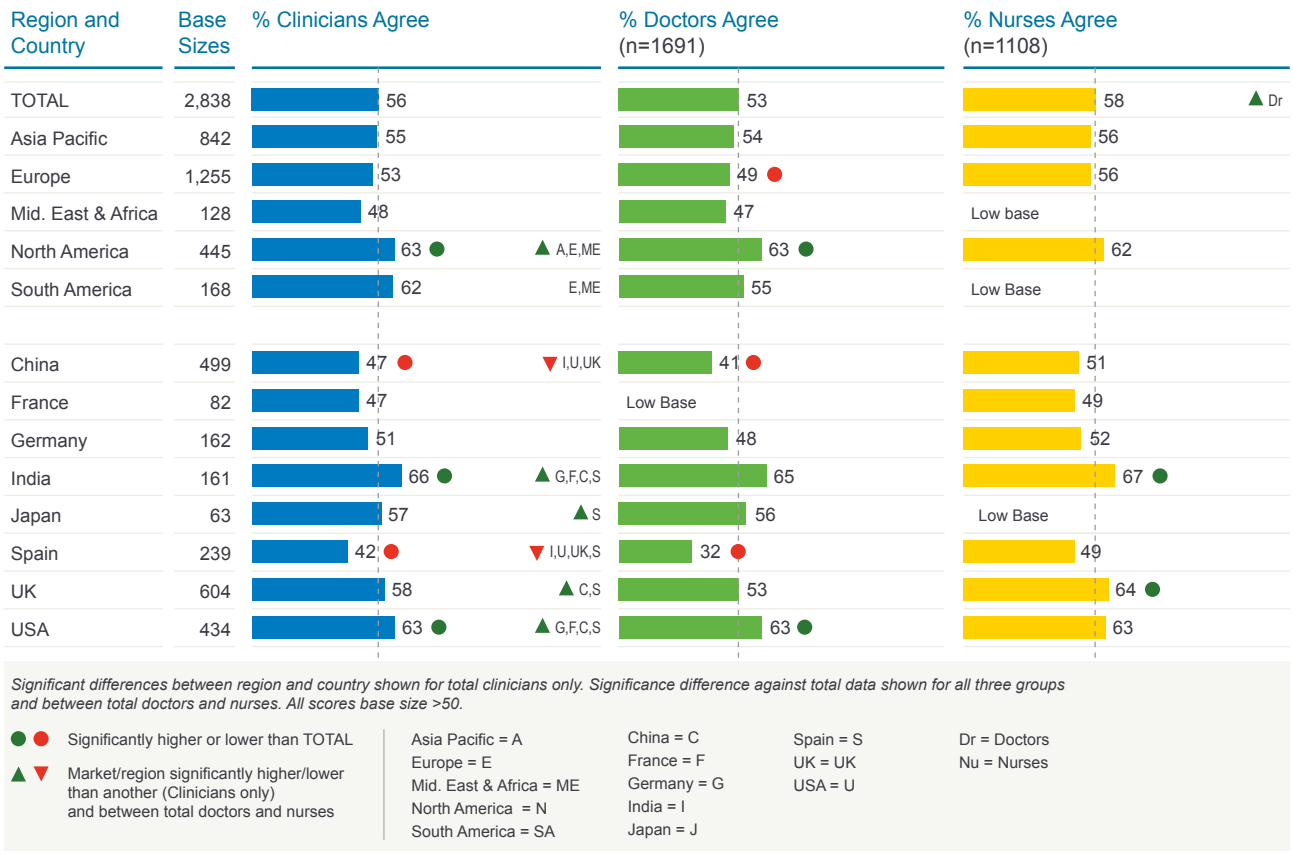


Fig 1: Question: To what extent do you agree or disagree with each of the following statements with regards to trends you have noticed over the past 10 years (from 2011 to 2021)? Shows % that agree: Patients have become more empowered to manage their own conditions.
For more information on base sizes for doctors and nurses, see Appendix on page 115.

Armed with a self-diagnosis and supporting information, the empowered patient approaches a clinician with expectations of a matching diagnosis and corresponding treatment. However, not all clinicians welcome this. In their comments in the Clinician of the Future survey, many respondents shared their frustrations with inaccurate internet diagnoses. This is echoed in the National Institute on Aging's advice to patients on preparing their visit to a doctor, which does not mention self-diagnosis at all.[6]

Historically, healthcare was provided via a paternalistic role-based approach, with the doctor in the position of power. Patient empowerment, among other factors, is shifting this to a more team-based approach, with the patient at the center. Decisions are much less likely to be left to the clinician; more and more, they are made collaboratively, with the clinician providing advice and guidance.

A divided patient population

Empowerment is not a linear process. Even the most empowered patient can become vulnerable and need more support when faced with a life-changing diagnosis; a patient's care needs can change throughout their life.

While access to information is helping some patients advocate for themselves at certain points in their lives, empowerment is further away for others. For example, people who cannot read, those who lack internet access, and those who don't have the understanding or the time to seek health-related information are likely to rely more on clinicians' knowledge and expertise.

Health literacy is also highly variable. Analysis by the Centers for Disease Control and Prevention (CDC) showed that even in those areas considered the most health literate in the USA, 15-27% of people had limited health literacy; this percentage reached 59% in less health literate areas.[7]

The COVID-19 pandemic has highlighted this variability – clinicians encounter a range of people, from 'armchair epidemiologists' to those who don't understand science or trust the health authorities.[8] This information gap is exacerbating the gap in access to health (see Chapter 5: The Future Accessible Clinician on page 92).

Why health literacy matters

Research shows that health literacy – "personal characteristics and social resources needed for people to access, understand and use information to make decisions about their health" – is significantly associated with involvement in medical decision making. In other words, the more health literate a patient is, the more they can take part in their own healthcare.[9]

According to the CDC, people living in the most health literate areas have 31% more flu vaccinations, 26% fewer avoidable hospitalizations and 18% fewer emergency department visits.[10]

This isn't the only divide among patients today. For example, generational differences set groups apart. While many baby boomers (born between 1946 and 1964) do use the internet, they may be less inclined to search online for possible diagnoses. *Physician's Weekly* noted that "Despite heavy internet use, Baby Boomers still are dependent on asking providers questions."[11] In comparison, 60% of millennials (born between 1981 and 2000) support the use of telehealth, and they even encourage clinicians to do the same – 71% "would like their doctors to adopt a mobile health application." Gen Z (born between the mid-90s to early-2010s) are even more likely to use digital health technologies.

"Patient-doctor relationships are more even and more informative than before."

Clinician, Japan, who responded to the Clinician of the Future survey.

Patients also differ by what they need from clinicians, according to those we interviewed as part of the Clinician of the Future study. Some patients have functional needs – their connection to healthcare services is impersonal, informational and with a clear treatment goal. Others need empathy – they value their personal connection with their clinician and need more than straight information. Those who are mostly healthy also have different needs from those who have a chronic illness. Patient preference frameworks exist to help clinicians with this, but their use is not widespread.[12]

The change in dynamic has influenced the relationships between patients and clinicians. Clinicians are adapting the way they work with the different types of patients. On any given day, they could see a patient who has already researched their symptoms (or potentially self-diagnosed) and connects virtually to request treatment, a patient who needs to have a caring conversation in-person to share their worries, and a patient who expects results in exchange for their investment, whether it's money or time.

Functional needs	Empathy needs	Consumer needs
Self-diagnoses	Seeks diagnosis	Expects diagnosis
Manages health online	Clinician manages health	Makes health decisions

"Patients are increasingly using me to get to an ends and demanding care the way they want it, instead of listening to all options, and making informed choices. The opinions of family members, online chats, and Google searches are deemed more important and informative than my trained opinion."

Clinician, USA, who responded to the Clinician of the Future survey.

As they navigate the different needs of the various types of patient, clinicians are looking to data and technology for support – especially when it comes to communication. The rise of telehealth and digital communication during COVID-19 meant clinicians could provide for the patients with functional needs more easily and efficiently.

The rise of digital communication during the pandemic also reinforced the importance of empathy. For the patients who value personal connection in particular, soft skills like listening and being empathetic are vital. In the Clinician of the Future survey, 82% of clinicians agreed that soft skills have become increasingly important in the last decade (2011 to 2021). In APAC this was even more prominent, with 92% of clinicians agreeing.

Statement: Soft skills (e.g. listening, being empathetic) among clinicians have become increasingly important.

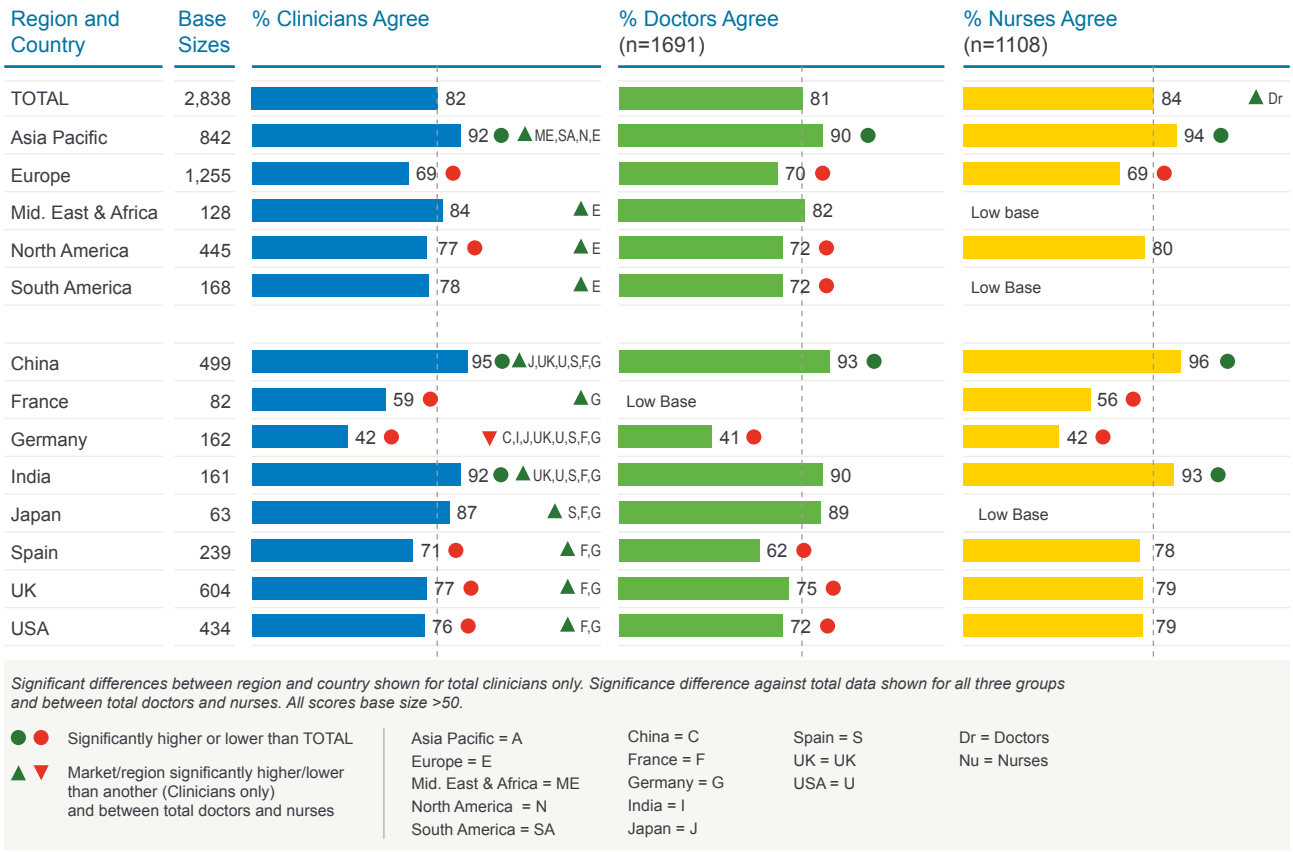


Fig 2: Question: To what extent do you agree or disagree with each of the following statements with regards to trends you have noticed over the past 10 years (from 2011 to 2021)? Shows % that agree: Soft skills (e.g. listening, being empathetic) among clinicians have become increasingly important. For more information on base sizes for doctors and nurses, see Appendix on page 115.

However, they already feel they are lacking the time to treat each patient the way they would like. When asked about their current experience working in healthcare in the Clinician of the Future survey, only half (51%) of respondents agreed the amount of time they are able to spend with patients is sufficient to give them good care. Of these clinicians, doctors (49%) are less likely to think the time they spend with patients is sufficient compared to nurses (54%). Clinicians (doctors and nurses) are especially concerned about this in Europe, where only 31% reported having sufficient time: 30% in France, 28% in Spain, and just 15% in Germany.

Statement: The amount of time I am able to spend with patients is sufficient to give them good care.

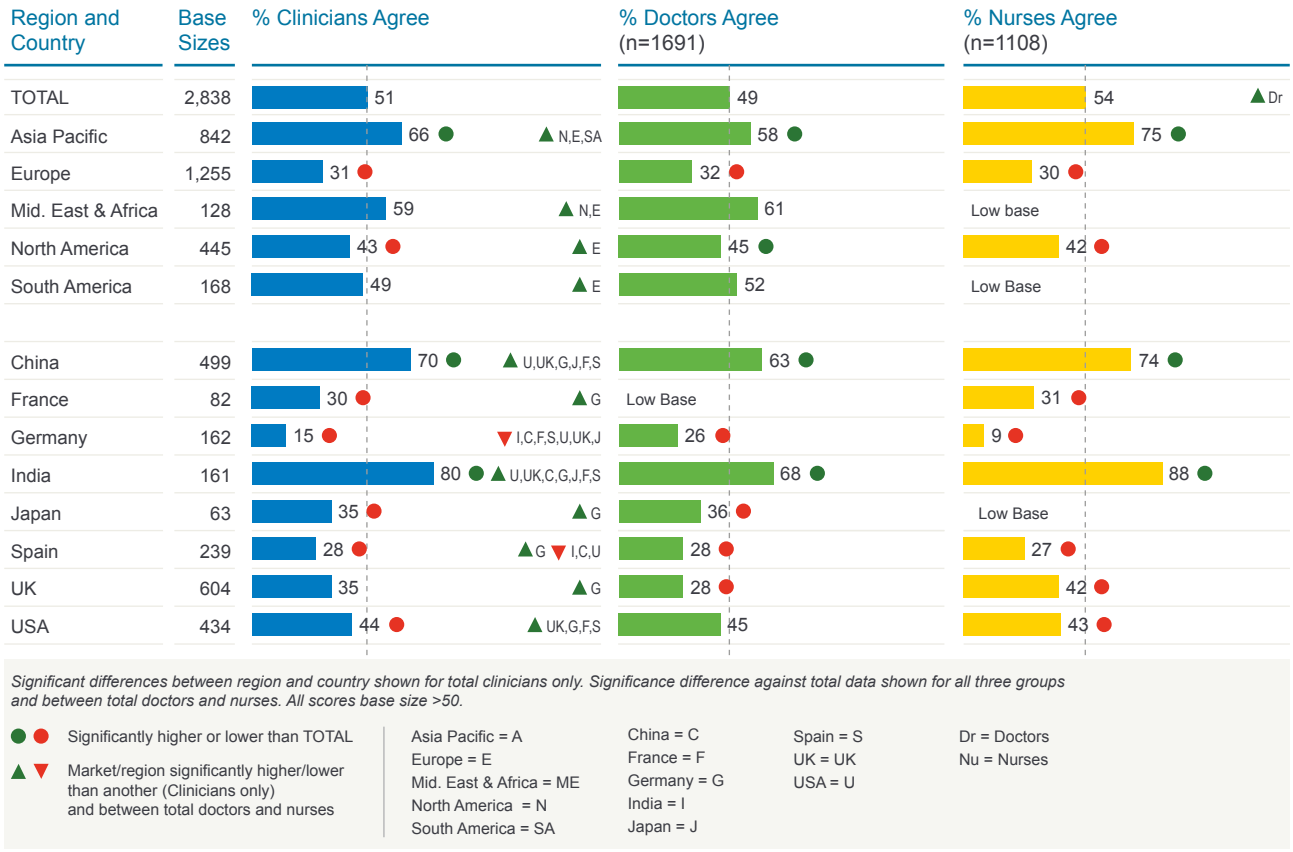


Fig 3: Question: To what extent do you agree or disagree with each of the following statements with regards to trends you have noticed over the past 10 years (from 2011 to 2021)? Shows % that agree: Soft skills (e.g. listening, being empathetic) among clinicians have become increasingly important. For more information on base sizes for doctors and nurses, see Appendix on page 115.

Coupled with rising patient expectations, this is putting increasing pressure on clinicians. In China, where clinicians have extremely limited time with each patient due to high volume, managing patient expectation is perceived as particularly challenging. In the China roundtable held for the Clinician of the Future study, key opinion leaders shared that patients have high expectations of healthcare, but the uneven medical resources and resulting pressure on doctors mean patients are often unsatisfied.

In the Clinician of the Future survey, clinicians around the world reported being under increasing pressure from patients, being subject to demands and receiving less respect.

"Patients' rights awareness has increased and respect for doctors has decreased"

Clinician, Japan, who responded to the Clinician of the Future survey.

Even though some patients are increasingly empowered to manage their own health, the system is not yet ready to support the emerging patient-centered care model. As key opinion leaders noted in the US roundtable held for the Clinician of the Future study, even the most health literate, engaged patient cannot be truly empowered if the infrastructure isn't in place.

The same is true for precision care, or personalized medicine. The idea of delivering bespoke treatment designed specifically for each patient is exciting. Advances in genomics in particular are opening the door to offering treatments tailored to individual patients. A bibliometric analysis of the published literature revealed exponential growth in publications on precision medicine between 2012 and 2018.[13]

Today, though, precision medicine is largely structurally unsupported. In the USA, for example, reimbursements are not set up for personalized medicine, and the modelling to utilize these new solution remains a challenge.[14] Clinicians are paid for delivering care based on treatment plans; if the best care for a patient falls outside the norm for their group, the clinician will not be reimbursed. There are also barriers to access connected to the broader challenges of health inequity (see Chapter 5: The Future Accessible Clinician on page 92).

Precision medicine

"Precision medicine, sometimes known as 'personalized medicine' is an innovative approach to tailoring disease prevention and treatment that takes into account differences in people's genes, environments, and lifestyles."[15]

Although precision medicine is not fully available to all patients today, clinicians believe it could be in the future: 77% of clinicians who responded to this survey expect personalized treatment approaches to be more widely used by 2031.

As the world progresses to this reality, clinicians will face a growing volume of patient data. The results from our survey show that the volume of patient data available is already overwhelming – 69% of the clinicians surveyed are currently experiencing this, with particularly high proportions of doctors (80%) and nurses (83%) in China agreeing (see Chapter 3: The Future Tech-Savvy Clinician on page 51). As the importance of patient data continues to grow, clinicians may require more time to learn about the data and how to understand it, further contributing to their increasingly unmanageable workloads (see Chapter 4: The Future Balanced Clinician on page 73).

What's driving change?

Even though health systems may have some catching up to do, clinicians consider patient empowerment one of the biggest drivers of change. In the Clinician of the Future study, 86% of clinicians surveyed agreed the rise of informed patients has been driving healthcare change in the last decade; this was especially the case in the APAC region, where 92% considered this to be driving change in healthcare. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

Statement: A greater number of informed patients is driving healthcare change.

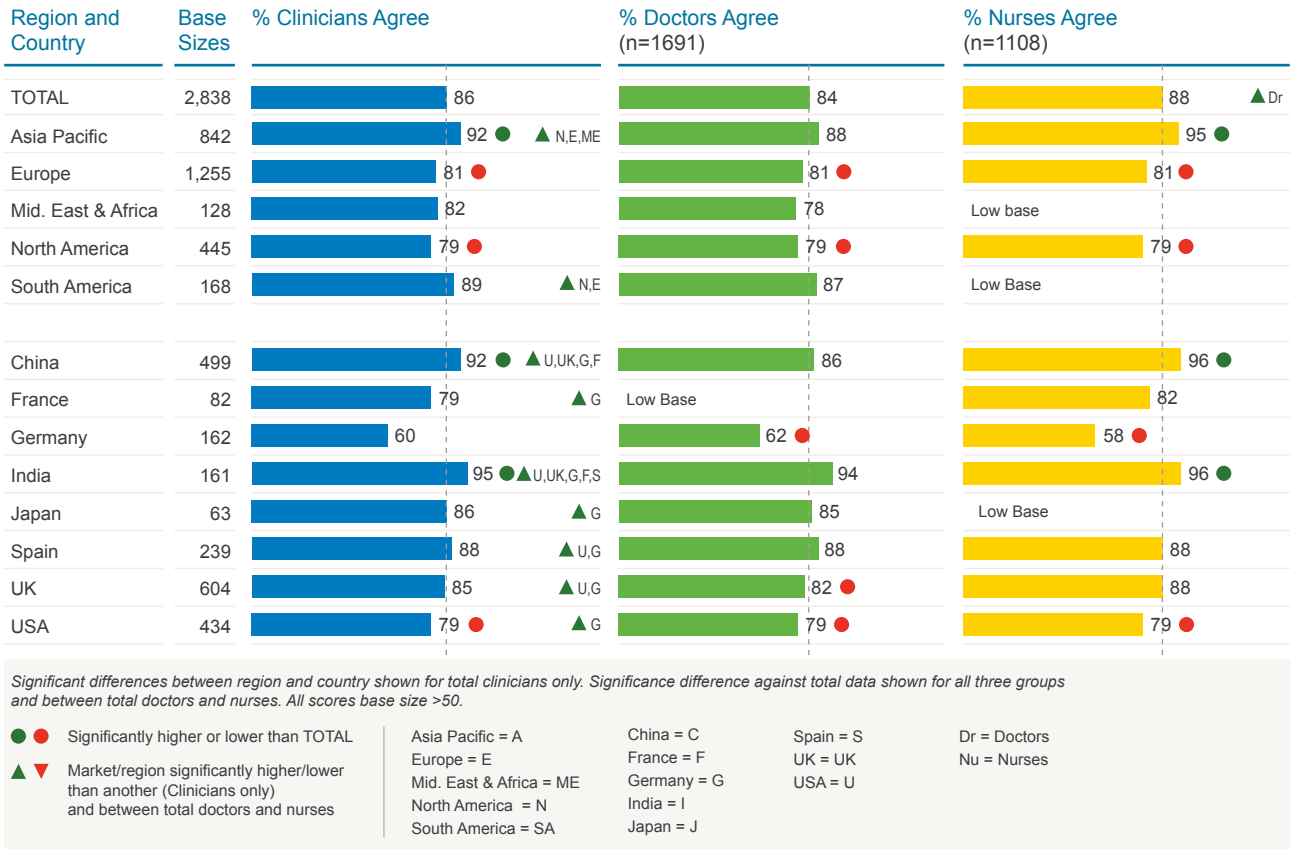


Fig 4: Question: To what extent do you feel each of the following are driving change in healthcare, if at all? Shows % to some/a great extent': Patients being more informed about their health conditions. For more information on base sizes for doctors and nurses, see Appendix on page 115.

Patient empowerment is a complex concept, and studies have attempted to define it and establish ways of measuring it.[16,17] One study mapped five main components of patient empowerment: underpinning ethos, interventions, moderators, indicators and outcomes of patient empowerment.[18] Understanding the factors that contribute to patient empowerment helps maximize the benefits – not just for the patient, but for the healthcare system around them.

Patient empowerment is already driving change in healthcare. In addition to reframing patient-clinician relationships, it is accelerating the move towards total health care: patients taking control of their health and requiring different, often broader, support from clinicians (see Chapter 2: The Future "Total Health" Clinician on page 35). Research suggests that patient empowerment could even help transform healthcare.[19]

What's in a word?

In a roundtable held for the Clinician of the Future study, key opinion leaders in the UK noted that 'patient' feels like an outdated term. Do we need a new vocabulary to go with patient empowerment? As people become more empowered to manage their own health, and with the move towards preventive care, clinicians will be working with people before they get sick – that is, before they become patients.

- Patient
- Person
- Citizen
- Customer
- Consumer
- Patient clinician

The (im)patient consumer

As patients become more empowered, their expectations are rising. They want to interact with clinicians in the way that suits them – virtually, in person, at the clinic, at home, directly or indirectly. They are pushing the boundaries of what we consider the norm today. Patients' needs are changing the landscape of patient-clinician communication and more.

Patients' own expectations are changing in tandem with the market. The appearance of tech giants in the healthcare arena is tipping the scales in patients' favor. The 'big four' tech giants – Apple, Amazon, Google and Microsoft – are experts in engaging people as consumers, and they are bringing this perspective to healthcare. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

As a consumer, healthcare looks different. In many settings, patients have been forced to accept the unreasonably long waiting times that would be unheard of in other service-oriented industries; with a more consumer-focused view, in the future they may not be.

Clinicians see the growing importance of the patient experience: in the Clinician of the Future survey, 90% of clinicians agreed that quality measures, including patient satisfaction, have driven change in the last decade (2011-2021).

Statement: Drivers of change in healthcare over the last decade (2011 to 2021)

Statement	% Clinicians Agree (Global Data) (n=2838)
The COVID-19 global pandemic	97
Rise of chronic diseases (e.g. heart disease, cancer, chronic obstructive pulmonary disease, diabetes)	94
Ageing population	93
Rise in mental health issues among the general population	91
Performance metrics / quality measures (e.g. length of stay, re-admission rate, waiting times, patient satisfaction)	90
Government policies	89
Cost containment measures taken by hospitals or clinics	89
Rise in antimicrobial resistance (AMR)	86
Patients being more informed about their health conditions	86
Rise of infectious diseases	86
Rise of health inequalities	81
Payer involvement in healthcare (e.g. insurance companies)	78

Fig 5: Question: To what extent do you feel each of the following are driving change in healthcare, if at all? Shows % that agree. For more information, see the Methodology section on page 109.

This is driving change in healthcare: cracks in the healthcare infrastructure are being highlighted as patients are less tolerant of mistakes, excessive administration and long waiting times. And institutions are beginning to look at value-based care (see Chapter 2: The Future "Total Health" Clinician on page 35) and preventive approaches that focus on patients' health rather than illness.

The future: from paternalism to partnership

> *"Move away from the nanny approach… enable people to manage their own care."*
>
> *Dr Charles Alessi, UK, who attended the Clinician of the Future UK roundtable.*

The clinician of the future will encounter the patient of the future, who will be more informed, engaged and empowered. More and more patients will be equipped to monitor and manage their own health, so they will likely be less reliant on their clinicians and therefore require fewer visits. Clinicians may be more likely to engage with patients periodically when they want to check in, especially those with chronic conditions.

They will be providing care when needed, and this will be orchestrated by the patient, who will be engaged with all of their care team.

This has the potential to help improve clinicians' workload. Patients who adhere to their prescribed medicine regimes, order refills on time, change their lifestyles and look after their mental health are more likely to require less time with clinicians. (See Chapter 4: The Future Balanced Clinician on page 73).

Many of the clinicians surveyed for the Clinician of the Future study expect patients will take more control in the next decade: 66% agreed patients will be more empowered to take care of their own health. Agreement was stronger in India (77%), while far fewer clinicians in Germany (49%) and France (50%) expected this.

Statement: Patients will be more empowered to take care of their own health.

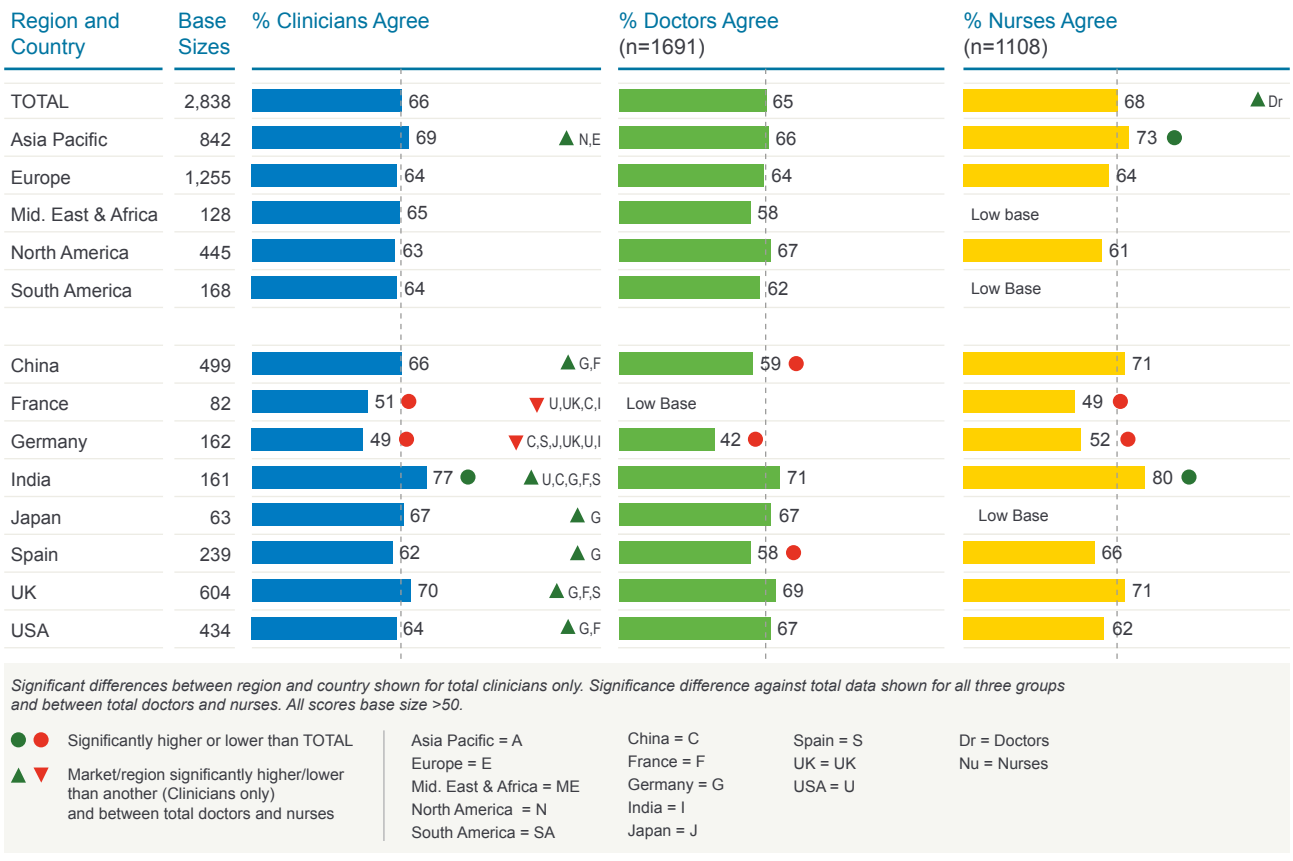


Fig 6: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: Patients will be more empowered to take care of their own health. For more information on base sizes for doctors and nurses, see Appendix on page 115.

Patients could be rewarded for taking control of their health in the future. In the Clinician of the Future survey, 60% of clinicians expected that, where applicable, patients who demonstrate that they actively maintain their health (for example, via wearables) will be rewarded with lower health insurance premiums, and 46% agreed they may receive preference for treatment such as surgery. In both cases, substantially more clinicians in China expected patients to benefit in these ways from managing their own health (77% and 66% respectively).

"Giving patients access to the right information allows us to empower our patients and results in a better health outcome."

Amanda Graham, Trinidad and Tobago, who participated in the Clinician of the Future student roundtable.

Statement: Where applicable, patients who demonstrate that they actively maintain their health (e.g. via wearables) will be rewarded with lower health insurance premiums.

Region and Country	Base Sizes	% Clinicians Agree	
TOTAL	2,838	60	
Asia Pacific	842	67 ●	▲ E,ME,SA
Europe	1,255	51 ●	▲ ME
Mid. East & Africa	128	40 ●	▼ N,E,A
North America	445	62	▲ E,ME,SA
South America	168	48 ●	▼ N,A
China	499	77 ●	
France	82	37 ●	▼ C,J,UK,U,I,G
Germany	162	66	▲ UK,I,F,S
India	161	53	▲ F,S
Japan	63	59	▲ F,S
Spain	239	40 ●	▼ C,J,UK,U,I,G
UK	604	55 ●	▲ F,S
USA	434	62	▲ UK,U,I,F,S

Statement: Patients who demonstrate that they actively maintain their health (e.g. via wearables) will be given preference for treatment (e.g. surgery, medication).

Region and Country	Base Sizes	% Clinicians Agree	
TOTAL	2,838	46	
Asia Pacific	842	60 ●	▲ N,E,ME,SA
Europe	1,255	31 ●	
Mid. East & Africa	128	36 ●	
North America	445	49 ●	▲ E,SA
South America	168	26 ●	▼ N,A
China	499	66 ●	▲ U,UK,I,G,F,S
France	82	22 ●	▼ C,J,U,I,G
Germany	162	35 ●	▲ F,S
India	161	53	▲ U,UK,G,F,S
Japan	63	56	▲ U,UK,G,F,S
Spain	239	23 ●	▼ C,J,UK,I,G
UK	604	32 ●	▲ S
USA	434	39 ●	▲ UK,F,S

Significant differences between region and country.

● ● Significantly higher or lower than TOTAL

▲ ▼ Market/region significantly higher/lower than another

Asia Pacific = A
Europe = E
Mid. East & Africa = ME
North America = N
South America = SA

China = C
France = F
Germany = G
India = I
Japan = J

Spain = S
UK = UK
USA = U

Fig 7: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: Where applicable, patients who demonstrate that they actively maintain their health (e.g. via wearables) will be rewarded with lower health insurance premiums.

Fig 8: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: Patients who demonstrate that they actively maintain their health (e.g. via wearables) will be given preference for treatment (e.g. surgery, medication).

Positive patient experience

Clinicians also recognize the growing group of patients seeking functional care. In the Clinician of the Future survey, 45% of respondents agreed patients will be less likely to feel the need to see clinicians face-to-face in 10 years' time, especially in North America (65%).

In addition, 50% of survey respondents expected a much higher proportion of patients to use chatbots to manage their treatment. Substantially more clinicians in China (56%) agreed there would be a rise in the use of chatbots; this was less in the USA (43%) and fewest in Australia (33%).

Statement: Patients will be less likely to feel the need to see clinicians face-to-face

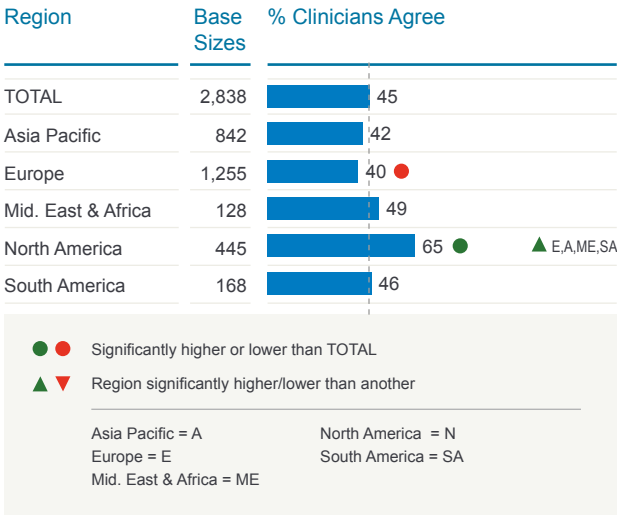


Fig 9: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: Patients will be less likely to feel the need to see clinicians face-to-face.

"In the future, we need to let go of the idea that we as a doctor will be the authority figure for the patient. It is important to communicate well and give the patient the proper information. But in the end, we will have to move to shared decision making between the doctor and the patient."

Femke Roelofs, the Netherlands, who participated in the Clinician of the Future student roundtable.

Statement: A much higher proportion of patients will use chatbots to manage treatment.

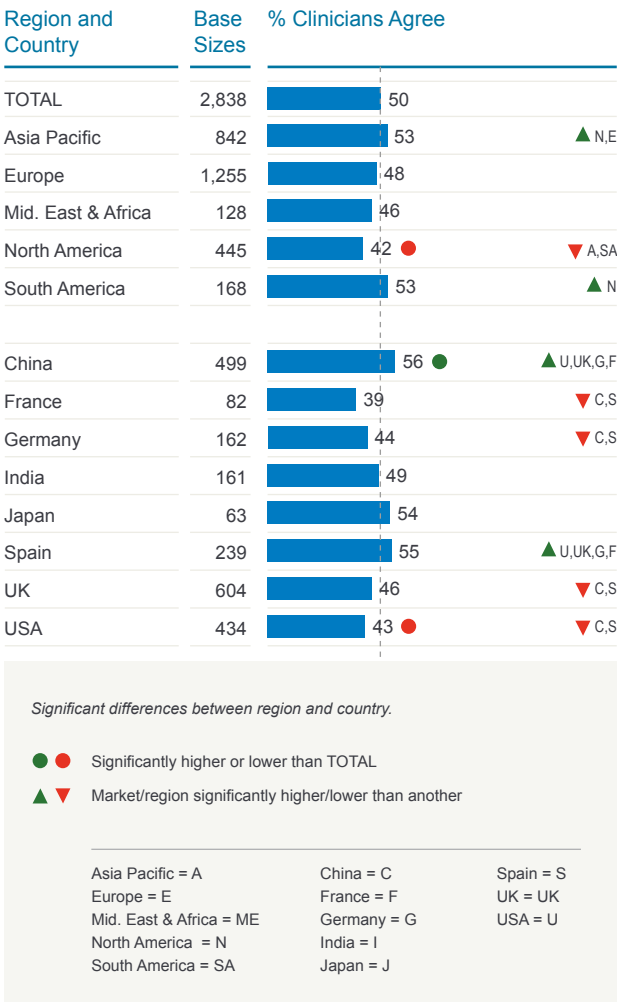


Fig 10: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: A much higher proportion of patients will use chatbots to manage treatment.

However, across all regions, there is a belief that clinicians will remain trusted health advisors: in the Clinician of the Future survey, only 41% agreed they will be less valuable to patients than today. Rather than becoming less valuable, clinicians expect their relationship with patients to become more of a partnership in the next 10 years – in the survey, 62% of respondents agreed.

Statement: The relationship between clinicians and patients will be more of a partnership.

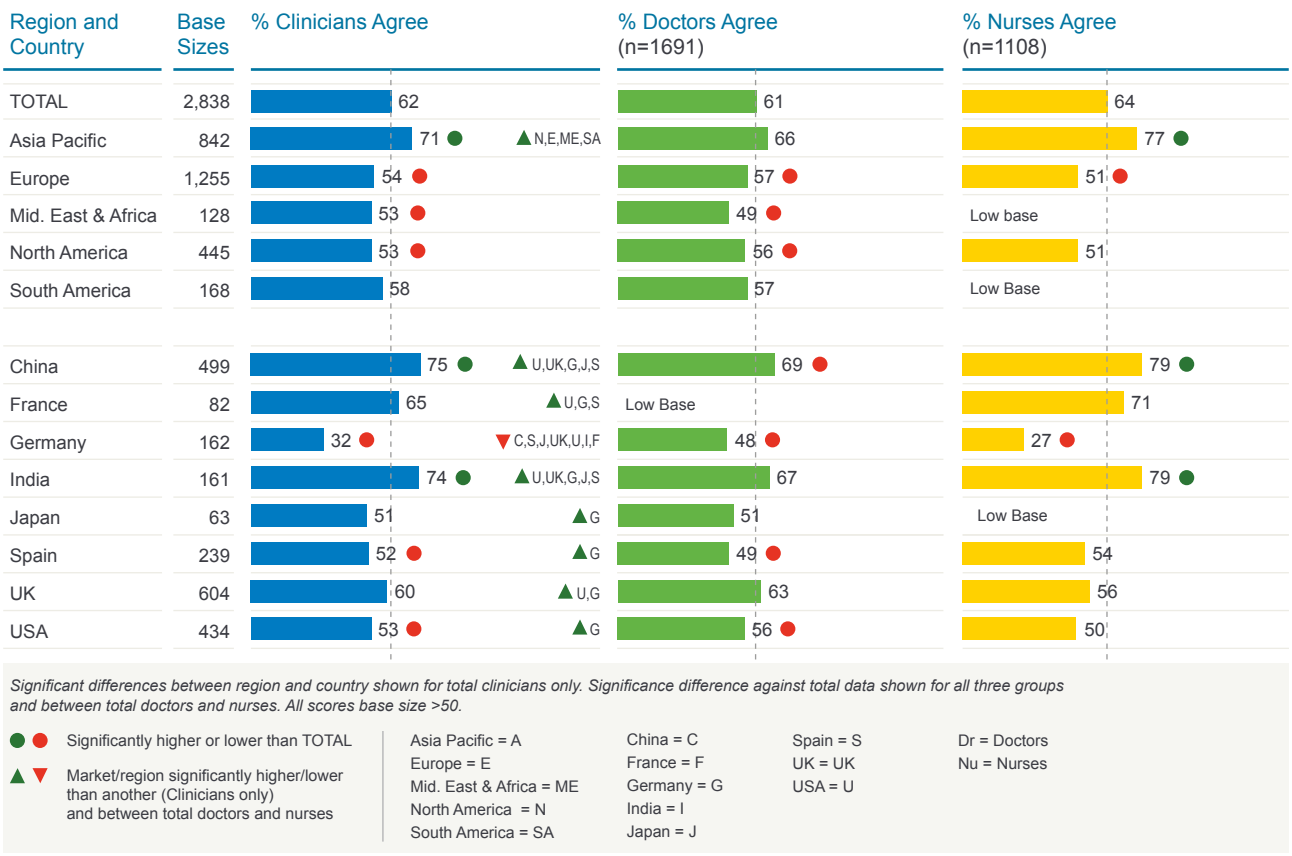


Fig 11: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: The relationship between clinicians and patients will be more of a partnership. For more information on base sizes for doctors and nurses, see Appendix on page 115.

"Information development, scientific and technological progress, and the popularization of medical knowledge have promoted the establishment of a new type of doctor-patient relationship. It is believed that the current role of doctors and patients is more inclined to cooperation and mutual assistance, which is a healthier and more benign development direction for disease treatment."

Clinician, China, who responded to the Clinician of the Future survey.

In the future, clinicians will likely be part of a care team structured around the patient at the core. In interviews and roundtables held as part of the Clinician of the Future study, clinicians shared their belief that patients will likely be even more involved in discussions about their health and treatment plans and will be asked for their input when decisions are being jointly made. The location of care is also likely to change – 49% of clinicians surveyed believe the majority of healthcare will be provided in a patient's home instead of a healthcare setting in the next 10 years.

When patient care isn't happening directly in the patient's home, it will often be taking place virtually: 63% of clinicians surveyed around the world expect the majority of their consultations to be remote in 10 years' time. But there is variation: 72% of clinicians in China agreed, and only 36% in France.

Statement: The majority of consultations between clinicians and patients will be remote.

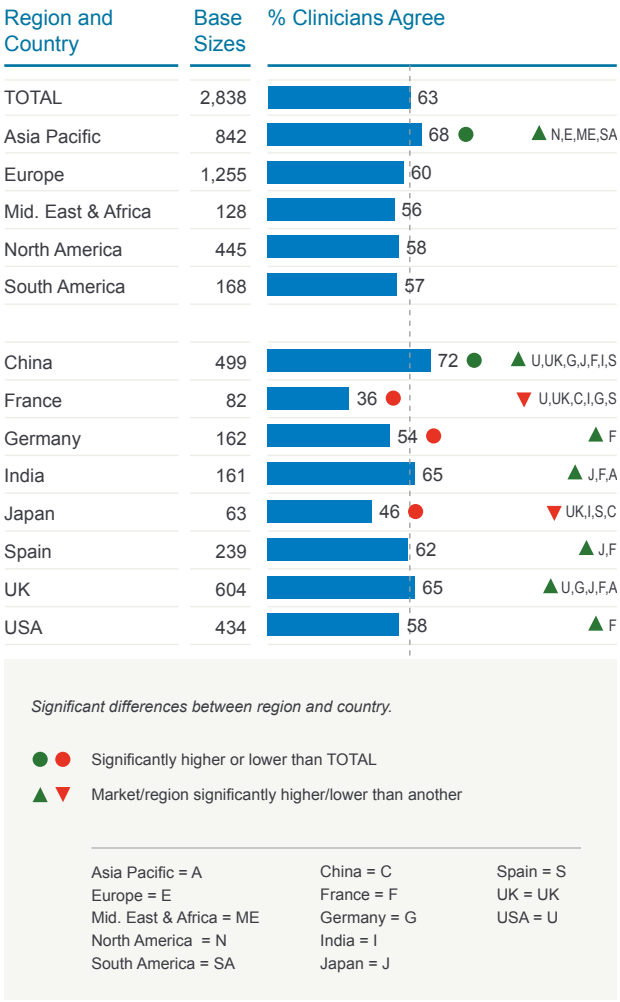


Fig 12: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % that agree with statement: The majority of consultations between clinicians and patients will be remote.

"To increase access to healthcare, the concept of hospital at home care via digital devices could be explored."

Dr Ian Tong, USA, who participated in the discovery interviews for the Clinician of the Future study.

The more central the patient's role becomes in their own healthcare, the higher their expectations are likely to be as a consumer. In the Clinician of the Future survey, 75% of clinicians agreed there will be a greater focus on the importance of patient experience in the future, especially in APAC (87%).

Statement: There will be a greater focus on the importance of patient experience.

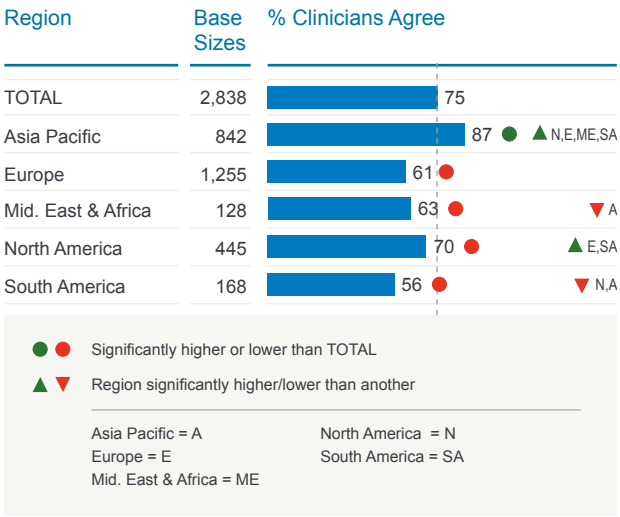


Fig 13: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % that agree with statement: There will be a greater focus on the importance of patient experience.

While this might improve matters for many patients, it is likely to put increasing pressure on clinicians to meet performance targets, which have been identified as a driver of change.

"Patients and their families are increasingly demanding. This puts considerable pressure on nurses."

Clinician, France, who responded to the Clinician of the Future survey.

A relationship built on empathy and trust

Communication could be a key element in ensuring a positive patient experience while avoiding overburdening clinicians. Even though a large proportion of empowered patients may prefer remote appointments and manage their own health, there will still be patients who need face-to-face consultations and rely on clinicians – not only for medical advice but also empathy.

> *"Communication is the single most important thing in a doctor-patient relationship."*
>
> *Dr Stan Shepherd, UK, who attended the Clinician of the Future UK roundtable.*

Clinicians will face the challenge of continuing to listen, communicate with understanding and treat patients with empathy in all the different relationship formats. While the role of empathy will not change much for patients who need a more traditional approach to healthcare, it may look different for empowered patients. For example, they might not need comforting face-to-face conversations, but rather to be heard, believed and involved in decisions.

Clinicians are acutely aware of the limitations of telehealth: in the Clinician of the Future survey, over half (51%) agreed it will negatively impact clinicians' ability to demonstrate empathy with patients. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

Patient empowerment brings the risk of information overload, which could be frightening for patients. In particular, those with chronic conditions may see the process of tracking their data as 'illness work', which could have a negative impact on their mental health.[20]

In these cases, clinicians may need to navigate a complex situation: patients have the information but are unable to understand or process it, and they may look to clinicians for support. In a report by the Patients Association, one patient said the aspect of their experience that brought them the most reassurance was the "Very clear explanation of my rare disease and the proposed treatment."[21]

Digital technology will put an additional screen – literally and metaphorically – between the clinician and their patient, requiring new approaches to delivering empathy. Even though clinicians are generally enthusiastic about digital health, it was clear in the roundtable interviews held for the Clinician of the Future study that some are concerned about its impact on this aspect of the clinician-patient relationship.

> *"I really believe that all of the first consultations should be in-person so that the patient can build trust and empathy. It is key that clinicians can earn their patients' trust."*
>
> *Paraskevi Samouti, Greece, who participated in the Clinician of the Future student roundtable.*

Although empathy will still be central in the clinician-patient relationship, clinicians acknowledge the skills required to keep up with the rise of digital health are becoming critical. Only 18% of respondents to the Clinician of the Future survey believe empathy will be one of the three most valuable capabilities for clinicians in 2031 – a decrease from the 29% who rank empathy as such in 2021. Instead, digital and data analytics skills rose to the top (see Chapter 3: The Future Tech-Savvy Clinician on page 51).

Key opinion leaders in the US roundtable held for the Clinician of the Future study were surprised to see the inversion of empathy and technology literacy in the future. They noted that empathy is not a skill that can be taught, and that medical students are not tested on their empathy. Rather, it is an essential core trait for future clinicians, and the skills they might need to develop will be in translating this in a digital environment. This will be especially important for working with patients who misunderstand or mistrust medical advice.

Medical records will be in patients' hands

Digital health will be another factor in improving trust – specifically giving patients access to, and even ownership of, their own medical records. Currently healthcare practitioners hold patients' medical records, and depending on location, patients often cannot access them. Some clinicians expect that patients will have much more control of their own medical records, enabling them to manage their health data directly. Rather than patients asking their clinicians for data, it could be that, in some cases and for certain data, clinicians will ask their patients.

> *"The citizen should be the primary data owner and the citizen should have their own, citizen owned, citizen held lifelong personal care record."*
>
> *Dr Stan Shepherd, UK, who attended the Clinician of the Future UK roundtable.*

Clinicians believe that patients who take ownership of their medical records will be better able to manage their own lifelong care, giving the clinician the chance to work with them taking a preventive approach (see Chapter 2: The Future "Total Health" Clinician on page 35). Greater ownership of their own health data will mean greater transparency, and therefore trust, in the clinician-patient relationship, supporting shared decision making.

In the Clinician of the Future survey, 74% of clinicians agreed a much higher proportion of patients will proactively review their own medical health records in the future. Substantially more clinicians in APAC agreed this will be the case (81%), and significantly fewer in South America (60%) and MEA (55%).

Statement: A much higher proportion of patients will proactively review their own medical health records themselves.

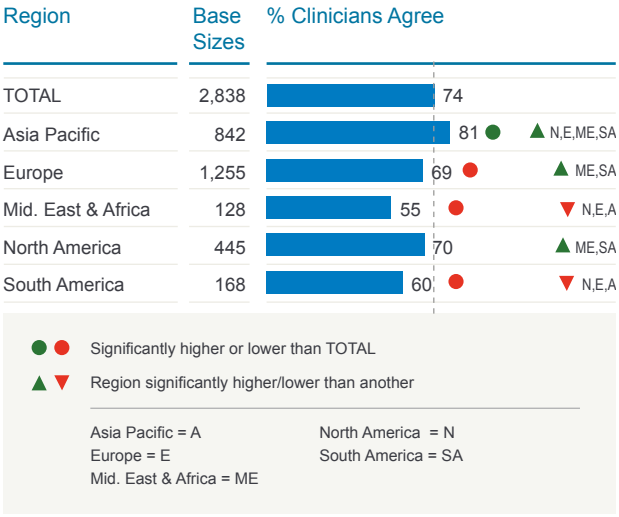


Fig 14: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: A much higher proportion of patients will proactively review their own medical health records themselves.

In the survey, 79% of clinicians agreed patients will have easy access to remote monitoring tools to assess their health and wellbeing in the next 10 years. This shift could provide part of the foundation patients will need to be empowered.

Statement: Patients will have easy access to remote monitoring tools to assess their health and wellbeing.

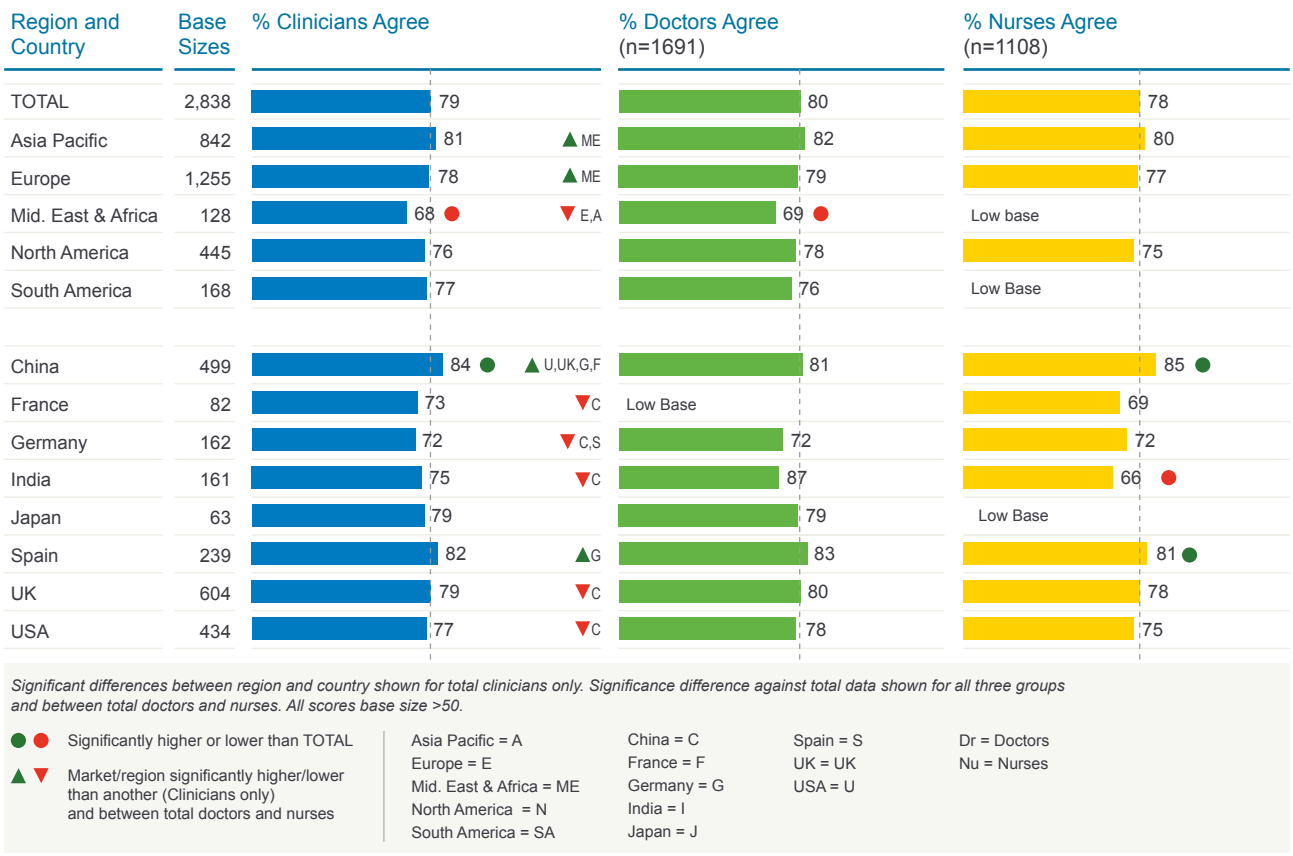


Fig 15: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around patients in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Patients will have easy access to remote monitoring tools to assess their health and wellbeing. For more information on base sizes for doctors and nurses, see Appendix on page 115.

Shifts in patient data ownership could be beneficial for clinicians as well as patients. The discovery interviews conducted for the Clinician of the Future study revealed that clinicians can often only access their patients' data if the patient is registered at their clinic. Given the administrative burden that is already stretching clinicians, a change in this administrative process could ease clinicians' workload. (See Chapter 4: The Future Balanced Clinician on page 73).

"Because patients will have their own data, they will be able to come to appointments with more information which will help us do our job and treat them."

Dr Omar Ibrik, Spain, who participated in the discovery interviews for the Clinician of the Future study.

However, shifts in data ownership brings with it challenges if access is not even. Data sharing is already complex and highly regulated, especially since the General Data Protection Regulation (GDPR) in Europe set out stringent data privacy rules. Data security is also a concern for clinicians – patients won't necessarily have the knowledge to manage their data securely, leaving clinicians at greater risk of breaches. If electronic health records (EHRs) are integrated with patients' personal health data, for example from wearables, this also brings the risk of hacking via the Internet of Things. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

Furthermore, clinicians may find themselves having conversations around the data rather than directly about what it means for the patient's health. Patients may also need their clinicians' support to feel at ease with data on their own health.

A central role for personalized and precision medicine (PPM)

Access to individual patient data in the context of Big Data and the use of AI and machine learning will be key to the rise of personalized medicine (see Chapter 3: The Future Tech-Savvy Clinician on page 51). As owners of certain types of health data, patients will contribute to the trend. In the Clinician of the Future survey, 77% of clinicians agreed personalized treatment approaches will be more widely used in the future. Many more clinicians in China (94%) agreed, while those based in the USA (59%) were least likely to agree personalized treatment approaches will be widely used.

Statement: Personalized treatment approaches will be more widely used.

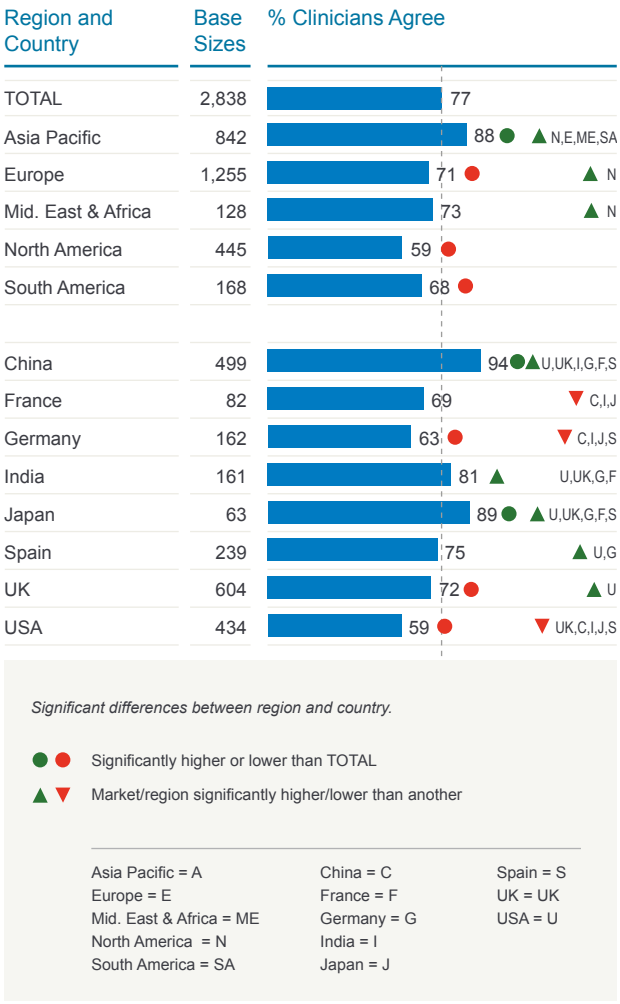


Fig 16: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Personalized treatment approaches will be more widely used.

The rise of personalized medicine will require data; 77% of clinicians surveyed overall expect real-time patient analytics to be critical to personalized care in the future, this rises to 86% in the Asia Pacific markets.

Statement: Real-time patient analytics will be critical to personalized care.

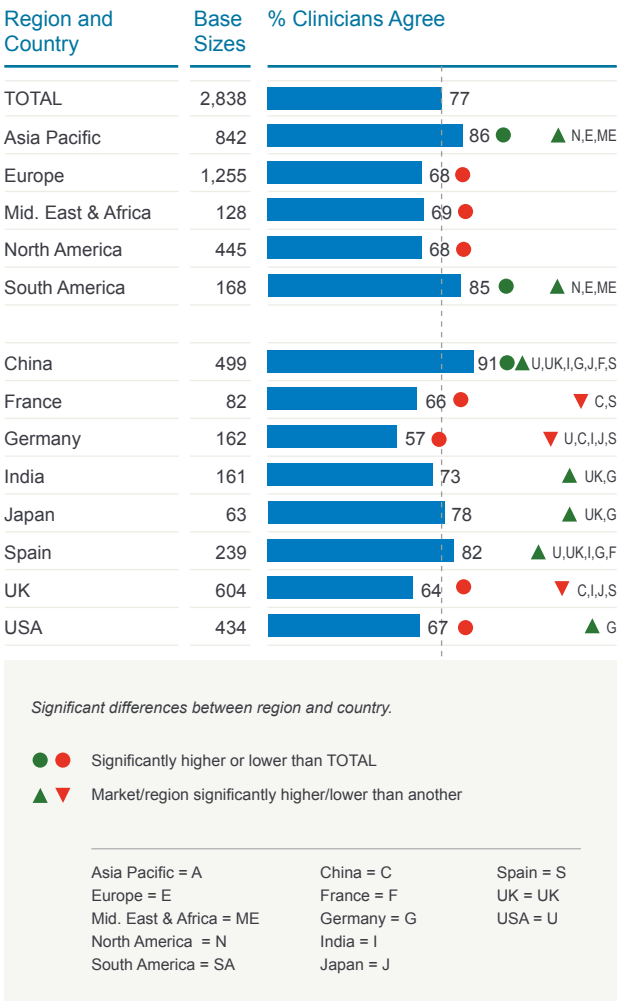


Fig 17: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Real time patient analytics will be critical to personalized care.

Genomics and proteomics data will be key to successful personalized care, especially in oncology. In the survey, 43% of clinicians believe every individual will have their genome sequenced to support disease prevention.

Statement: Every individual will have their genome sequenced to help prevent disease/ illness.

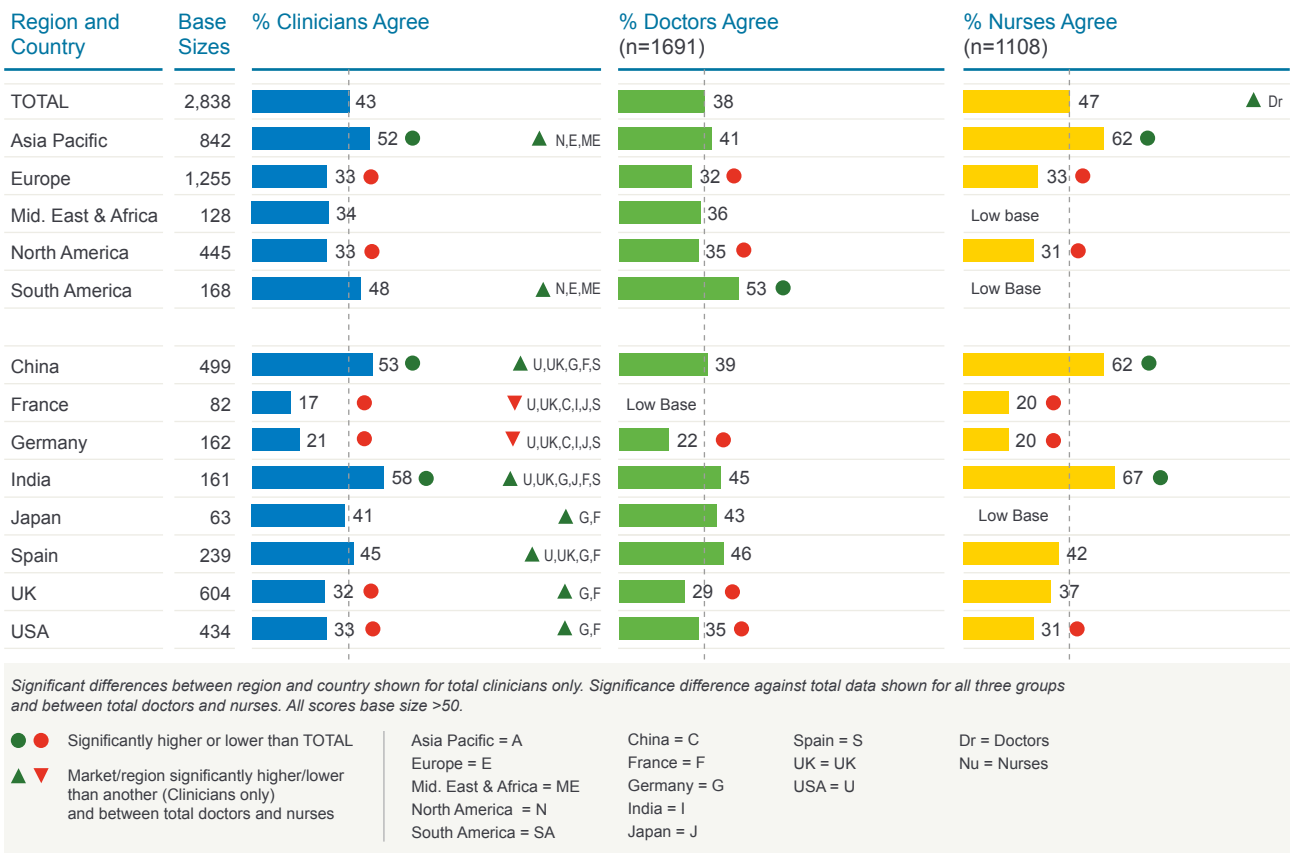


Fig 18: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Every individual will have their genome sequenced to help prevent disease/ illness. For more information on base sizes for doctors and nurses, see Appendix on page 115.

Personalized medicine: spotlight on APAC

In the survey, clinicians in the APAC region were substantially more likely to agree that personalized treatment approaches will be used widely in future compared to those in other regions. Substantially more clinicians from APAC also agreed genome sequencing for every patient will be commonplace.

Statement	% Clinicians agreed	
	Global	APAC
Every individual will have their genome sequenced to help prevent disease/ illness	43	52
Personalized treatment approaches will be more widely used	77	88

Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statements: Every individual will have their genome sequenced to help prevent disease/ illness; and Personalized treatment approaches will be more widely used. For more information, see the Methodology section on page 109.

How do we get there?

Equity is a critical consideration for the future of patient empowerment: clinicians are concerned that some patients may be left behind. How can this be avoided?

Key opinion leaders discussed inequity in the journey to empowerment during a US roundtable held for the Clinician of the Future study. Specifically, they mentioned there will always be people who are rich enough – in terms of money and time – to be empowered. These patients will need less support to engage with their data and use it to manage their health.

At the other end of the scale will be more vulnerable patients who may have multiple jobs, limited time and insufficient funds to invest in the digital technology that underpins personalized medicine.

> *"Who is being empowered? Which patients? Does this include those who are likely to suffer worse outcomes? Not all patients will be empowered."*
>
> *Dr Leo Anthony Celi, USA, who participated in the Clinician of the Future US roundtable.*

Similarly, at the UK roundtable, key opinion leaders agreed the people who could benefit most from advances in healthcare delivery are often those who are not empowered. If someone has a chronic illness and life gets in the way of health, will they have the capacity to tackle new tech and decipher data? It's not just about money and time, they said, but also having the headspace to engage in digital technologies and improve health literacy.

Educating patients for empowerment

Patient education could be key to ensuring inequity is not exacerbated. Greater health literacy for all patients could act as a foundational step to closing the health gap – and keeping it closed while the pressures of emerging technologies act to open it further.

Improved health literacy – including on digital health approaches – could also contribute to a more efficient healthcare system. Health literate patients need less support from their clinicians, not least because they are better able to manage and maintain their health.[22]

This is recognized by clinicians: In the Clinician of the Future survey, 19% identified patient healthcare education as a top-3 key support area in the next 10 years.

Key opinion leaders in the USA, UK and China all agreed there is insufficient health education contributing to patient health literacy. Not everyone is able to access education, and many will simply not learn how to be healthy. Health education is important not just for today's adult patients to improve literacy across the board, but also for tomorrow's patients. Building health literacy into school curriculums could be a way to ensure baseline health literacy in the future.

As people become increasingly responsible for managing their own healthcare, information will become more important. Empowered patients seeking information online will benefit from knowing how to discern credible, trustworthy content. Patients need to have access to reliable information, rather than rely on unverified sources on social media, which has the potential to disrupt the shift towards a more efficient healthcare system.

> *"Easily available information about diseases and treatment modalities from internet and social media and unqualified social media influencers suggesting treatments make the general public question or become sceptical about the qualified opinions of the doctor."*
>
> *Clinician, India, who responded to the Clinician of the Future survey.*

There will be gaps to fill here – 87% of clinicians in the survey agreed healthcare information for patients already needs to be improved, and this is likely to become even more critical in the future. The kind of health information needed will likely look different to what today's patients use. The way people digest information is changing, and patients are unlikely to engage with long-in-depth text-based sources. Among other interventions to support health literacy, the CDC recommends using video and other visuals to support consumer understanding.[23]

Soft skills and hard data in the medical curriculum

Clinicians provide patients with health information, ideally in a way they can understand and act on it. Those who participated in the Clinician of the Future discovery interviews emphasized that there is no 'cookie-cutter' patient, and therefore no standard approach to delivering information that suits every single patient. Clinicians may benefit from training that incorporates information sharing within communication, which is expected to remain central.

'Soft skills' such as listening, being empathetic and communicating are increasingly important. In the Clinician of the Future survey, 82% of clinicians agreed with this.

As well as learning communication skills, clinicians also believe education on digital health technology will help them deliver better care. In the Clinician of the Future survey, when asked about their top 3 priority support areas in the next 10 years, 38% of clinicians identified training in the effective use of digital health technologies to assist in the delivery of patient care remotely, and 25% identified training in the effective use of data to help deliver better patient care.

This combination of soft skills and digital knowledge will help clinicians adapt to the different types of patient relationships they will encounter in the future. It will also help to alleviate the concern many have expressed about potential problems with building empathy in a digital environment. However, for this to be effective, clinicians will need the time and headspace to learn, adapt and embrace new approaches (see Chapter 4: The Future Balanced Clinician on page 73).

Going digital: systems and infrastructure

Even if a patient is health literate, equipped with vast amounts of personal health data and armed with diagnostic information, without the right infrastructure in place, they will not be truly empowered to manage their health within the system.

While we may tend to think of digital health tools as being those that measure and monitor various aspects of patients' health, there is another angle to consider in working towards the future of healthcare. The clinician and their empowered patient partner could use tools for information, communication and engagement that ensure patients are not misled by misinformation. Collaboration tools could guide discussions and joint decision making.

To be successful in this context, the tools need innovation and implementation. Tech companies are motivated to develop new solutions and iteratively improve them – they have the resources, and there is consumer appetite for them.

The implementation aspect is where the challenges could lie. In order to use the digital tools optimally, patients and clinicians will benefit from a grounding in health knowledge and digital skills respectively (see previous sections). Research also shows that tools like patient portals and eHealth interventions only impact patient empowerment when clinicians and patients work in partnership.[24]

Implementing digital tools on an institutional or even system level could be much more difficult, depending on the context. For a large, complex, and established system like the National Health Service (NHS) in the UK, setting up digital tools that support the clinician-patient relationship is a slow process. Conversely, in markets where the health system is more granular and/or privatized, technology that makes communication and health management more efficient is more likely to be adapted, therefore quickly improving healthcare.

Today's challenges	Action	Tomorrow's opportunities
➤ Patients are more empowered, but can't always access the information they need ➤ Empathy is important but challenging on-screen ➤ Time is in short supply for good patient care	➤ Improve health literacy ➤ Focus on soft skills and hard data in the medical curriculum ➤ Support the move to digital with systems and infrastructure	➤ Patients are more informed and empowered to manage their own health ➤ Digital tools support the patient–clinician partnership ➤ Clinicians have the time and skills to partner with their patients

Chapter 1: References

1 Terrell, G. E. The physician of the future: a precisionist who sees patients as they are. Stat. 26 December 2017. https://www.statnews.com/2017/12/26/physician-future-precision-medicine/

2 Major, I. Two-Sided Information Asymmetry in the Healthcare Industry. Int Adv Econ Res 25, 177–193. 3 May 2019. https://doi.org/10.1007/s11294-019-09732-9

3 Symptomate. https://symptomate.com/

4 Coursera. Medical courses. https://www.coursera.org/courses?query=medical

5 Lupton, D. and Jutel, A. 'It's like having a physician in your pocket!' A critical analysis of self-diagnosis smartphone apps. Social Science & Medicine, Volume 133, Pages 128-135. 2015. https://doi.org/10.1016/j.socscimed.2015.04.004

6 National Institute on Aging. How to Prepare for a Doctor's Appointment. 3 February 2020. https://www.nia.nih.gov/health/how-prepare-doctors-appointment

7 UnitedHealth Group. Improving Health Literacy Could Prevent Nearly 1 Million Hospital Visits and Save Over $25 Billion a Year. October 2020. https://www.unitedhealthgroup.com/content/dam/UHG/PDF/About/Health-Literacy-Brief.pdf

8 Jaiswal, J., LoSchiavo, C. & Perlman, D.C. Disinformation, Misinformation and Inequality-Driven Mistrust in the Time of COVID-19: Lessons Unlearned from AIDS Denialism. AIDS Behav 24, 2776–2780. 21 May 2020. https://doi.org/10.1007/s10461-020-02925-y

9 Brabers, A. E. M. et al. What role does health literacy play in patients' involvement in medical decision-making? PLOS ONE. 3 March 2017. https://doi.org/10.1371/journal.pone.0173316

10 UnitedHealth Group. Improving Health Literacy Could Prevent Nearly 1 Million Hospital Visits and Save Over $25 Billion a Year. October 2020. https://www.unitedhealthgroup.com/content/dam/UHG/PDF/About/Health-Literacy-Brief.pdf

11 Chambers, B. The Generational Differences in Healthcare Technology. Physician's Weekly. 12 July 2016. https://www.physiciansweekly.com/the-generational-differences-in-healthcare-technology

12 Russo, S et al. Understanding Patients' Preferences: A Systematic Review of Psychological Instruments Used in Patients' Preference and Decision Studies. Value in Health, Volume 22, Issue 4, 491-501. 1 April 2019. https://doi.org/10.1016/j.jval.2018.12.007

13 Williams, J. R. et al. Current applications of precision medicine: a bibliometric analysis. Value in Health Vol. 16, No. 4. 3 July 2019. https://doi.org/10.2217/pme-2018-0089

14 Faulkner, E. et al. Challenges in the Development and Reimbursement of Personalized Medicine—Payer and Manufacturer Perspectives and Implications for Health Economics and Outcomes Research: A Report of the ISPOR Personalized Medicine Special Interest Group. Value in Health Vol. 15, Issue 8, 1162-1171. 10 September 2012. https://doi.org/10.1016/j.jval.2012.05.006

15 FDA. Precision Medicine. 27 September 2018. https://www.fda.gov/medical-devices/in-vitro-diagnostics/precision-medicine

16 Barr, P. J. et al. Assessment of Patient Empowerment - A Systematic Review of Measures. PLOS ONE. 13 May 2015. https://doi.org/10.1371/journal.pone.0126553

17 Castro, E. M. et al. Patient empowerment, patient participation and patient-centeredness in hospital care: A concept analysis based on a literature review. Patient Education and Counseling, Volume 99, Issue 12, 1923-1939. December 2016. https://doi.org/10.1016/j.pec.2016.07.026

18 Bravo, P., Edwards, A., Barr, P.J. et al. Conceptualising patient empowerment: a mixed methods study. BMC Health Serv Res 15, 252. 1 July 2015. https://doi.org/10.1186/s12913-015-0907-z

19 Lenert, L. Transforming healthcare through patient empowerment. Information Knowledge Systems Management, vol. 8, no. 1-4, 159-175. 2009. https://doi.org/10.3233/IKS-2009-0158

20 Ancker J.S. et al. "You Get Reminded You're a Sick Person": Personal Data Tracking and Patients With Multiple Chronic Conditions. J Med Internet Res, 17(8), 202. August 2015. https://doi.org/10.2196/jmir.4209

21 The Patients Association. Being a patient: First report of the Patients Association's patient experience programme. P16. July 2020. https://www.patients-association.org.uk/Handlers/Download.ashx?IDMF=16708179-90d6-41dd-a360-2c53b7e9ebe7

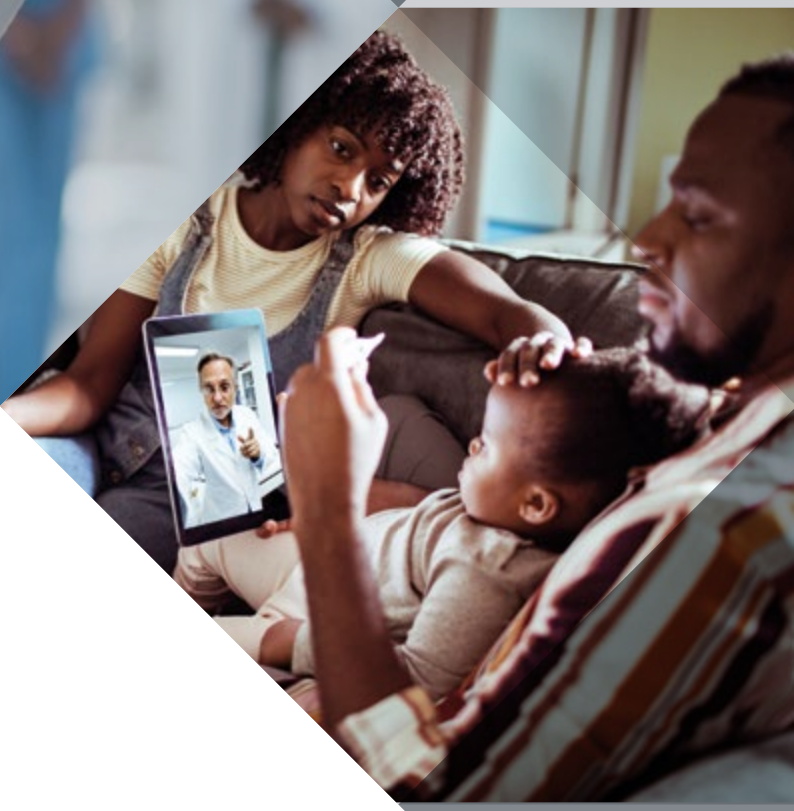
22 UnitedHealth Group. Improving Health Literacy Could Prevent Nearly 1 Million Hospital Visits and Save Over $25 Billion a Year. October 2020. https://www.unitedhealthgroup.com/content/dam/UHG/PDF/About/Health-Literacy-Brief.pdf

23 UnitedHealth Group. Improving Health Literacy Could Prevent Nearly 1 Million Hospital Visits and Save Over $25 Billion a Year. October 2020. https://www.unitedhealthgroup.com/content/dam/UHG/PDF/About/Health-Literacy-Brief.pdf

24 Ammenwerth E. et al. Effects of Adult Patient Portals on Patient Empowerment and Health-Related Outcomes: A Systematic Review. Stud Health Technol Inform, 264, 1106-1110. 21 August 2019. https://doi.org/10.3233/SHTI190397

Chapter 2

The Future "Total Health" Clinician



ELSEVIER

Health

Moving the focus from illness to health

Meet the clinician focused on "total health".

The clinician of the future will get a head-start on health, taking a preventive approach and working with people to enable them to manage their own mental and physical health before they become ill – including through regular checkups. This will be helpful given the growing patient population, as the rate of non-communicable diseases (NCDs) rises and the population ages. The clinicians' education will have been focused not just on clinical knowledge and transferable skills like communication, but also on leadership, finance management and data science. With a broader view of the healthcare system and a role in policy, the clinician will be supported to focus even more on outcomes rather than procedures. They work in the healthcare setting and beyond, as part of an interdisciplinary team. As they are financially incentivized to promote patients' health through value-based care rather than treat their disease, cost has less of an impact on their decision making. They work within an integrated healthcare system that focuses on prevention.

Today	Drivers of change	The future	Action
Treating illness, not promoting health: Only 42% of survey respondents agreed that the government priorities on healthcare are the right ones, and 79% agreed there is not enough being done on preventive care. **Focus on finance:** 68% of clinicians surveyed agreed there is too much focus on cost rather than care; agreement was particularly high in North America (82%) and Europe (74%).	**Population growth and aging:** 84% of clinicians surveyed agreed patients with age-associated diseases will make up the majority of the patient population, and 93% identified the ageing population as a key driver of change. **Non-communicable diseases:** 71% of clinicians agreed there will be an increase in comorbidities among younger patients in 10 years. **Empowered patients:** The move toward patient-centered care is driving a preventive approach.	**Preventive healthcare:** 56% of clinicians surveyed expect a much higher proportion of patients will attend regular mandated health check-ups in the future, rising to 80% in China. 73% of clinicians identified that managing public health will be a key priority in their role in 10 years' time. **Collaboration:** Clinicians expect to work with a wider multidisciplinary team, which may include data analysts. There will be better alignment between all the stakeholders involved in the delivery of healthcare.	➤ Evolve to the healthcare system – first ask why ➤ Educate tomorrow's medical leaders, including soft and digital skills ➤ Bring healthcare and policy closer together

Today's healthcare system needs urgent change

According to the World Health Organization (WHO), "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[1] Yet the healthcare systems in which today's clinicians work are designed primarily to treat disease. Clinicians largely focus on the individual's ailments, with a disease-specific approach to treatment and often struggle to effectively manage patients with increasing amounts of comorbidities.

This was one of the most important of the interconnected challenges clinicians identified in the qualitative interviews. Alongside administration inefficiencies and hectic schedules, they identified the focus on the treatment of symptoms instead of preventive care as problematic.

"Preventative treatment needs to be improved and should be an urgent goal for all countries around the globe."

Dr Hany Atallah, USA, who participated in the discovery interviews for the Clinician of the Future study.

In the Clinician of the Future survey, respondents acknowledged the shift to preventive care: 73% of clinicians surveyed identified that managing public health will be a key priority within the clinician's role in 10 years' time.

Statement: Managing public health will be a key priority within a clinicians' role with regard to where healthcare will be in 10 years' time.

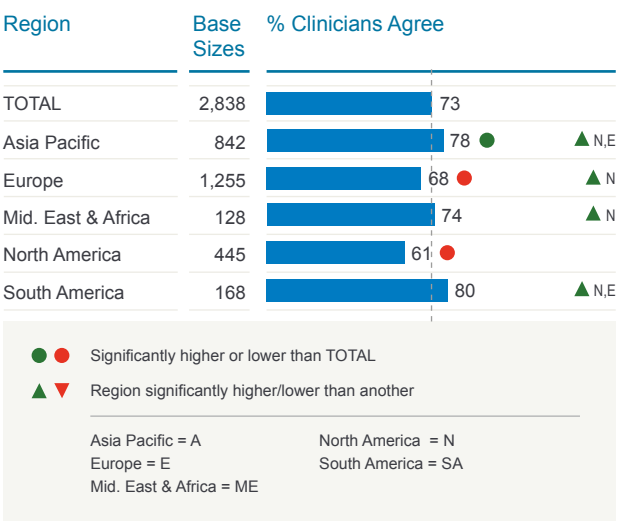


Fig 19: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % clinicians that agree: Managing public health will be a key priority within a clinicians' role.

Traditionally, public health has taken the role of preventive health control and information dissemination. Governments aim to manage broader contributors to health, such as nutrition and exercise, through public information campaigns. Although interventions often lack the impact they aim to have, there are several examples of success. The COVID-19 pandemic is the most recent example of how effective government can be: public health officials have taken the lead on ensuring the greatest possible vaccine coverage and adherence to mitigation efforts.

Although it has a broader remit, public health echoes the approach that clinicians have been encouraged to adopt: health is tackled in a disease-specific or cause-specific way – for example, by having moonshot programs aimed at curing cancer – such as the National Cancer Institute's Cancer Moonshot[2] – or running campaigns to encourage smoking cessation.

The Clinician of the Future survey reflects the misalignment of policy: only 42% of respondents agreed that the government priorities on healthcare are the right ones. Clinicians in China buck the trend: most (89%) think their government has set the correct priorities. This is in stark contrast to clinicians in Germany (4%) and France (9%), who are least likely to agree, followed by Spain (13%), Japan (16%), the USA (20%) and the UK (22%).

Statement: The Government priorities on healthcare are the right ones

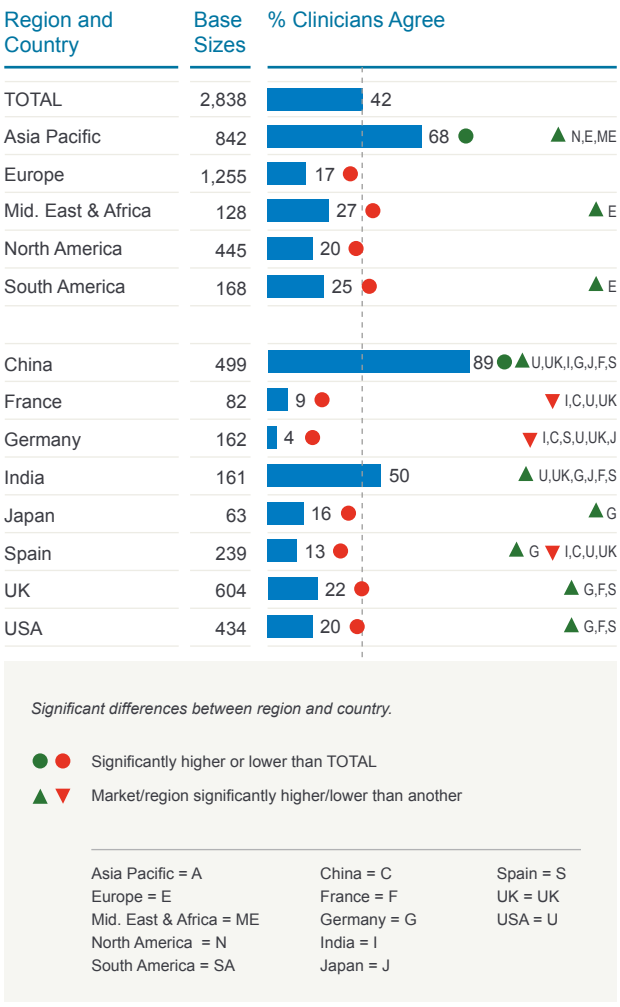


Fig 20: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare. Shows % clinicians that agree statement: The Government priorities on healthcare are the right ones.

Clinicians give an indication of where there might be misalignment, 79% believe there is not enough being done on preventative care, this is particularly high in North America (86%) and South America (87%).

Statement: There is not enough being done on preventative care

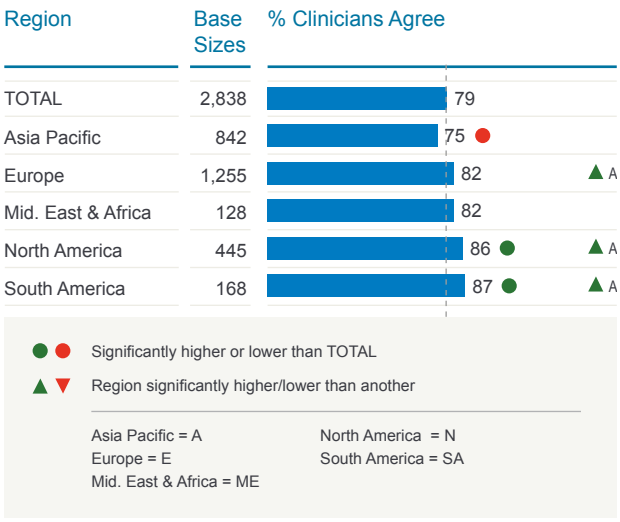


Fig 21: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare. Shows % clinicians that agree: There is not enough being done on preventative care.

The power of financial incentives

Another major challenge clinicians identified in the Clinician of the Future study is cost-driven medicine. Regardless of the financial structure underpinning the system, healthcare is reliant on funding, and cost-savings have an impact on every element of the system.

In particular, the reimbursement approach seen in the USA is perceived as not being set up for preventive care. Many clinicians are financially incentivized to perform procedures and see as many patients a day as possible. This inevitably has an impact on the decisions they make: between companies recommending a certain treatment path on one side and patients who expect the best possible care on the other. It also contributes to their work overload: with so many providers and payers with differing financials, clinicians are overwhelmed with bureaucracy.

In the Clinician of the Future survey, 68% of clinicians around the world agreed there is too much focus on cost rather than care; agreement was particularly high in North America (82%) and Europe (74%), with Germany (92%), the USA (83%) and France (83%) being the countries with highest agreement.

Statement: There is too much focus of cost rather than care

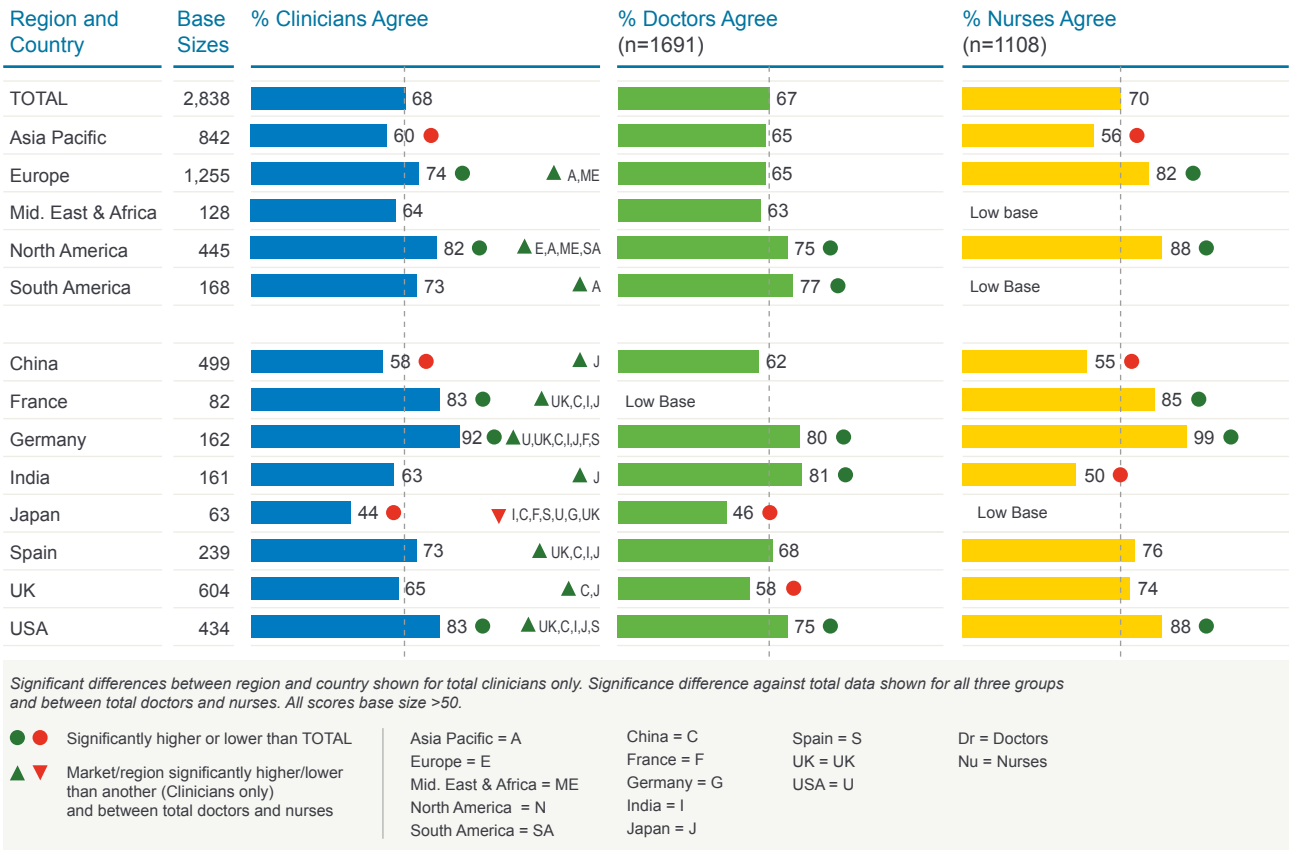


Fig 22: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare. Shows % clinicians that agree: There is too much focus on cost rather than care. For more information on base sizes for doctors and nurses, see Appendix on page 115.

This approach is recognized as being unsustainable by some; according to a 2019 report by Deloitte, 70% of Americans surveyed cited the US healthcare system as being "in a state of crisis" or having "major problems."[3] And the system is underperforming relative to the country's vast investment in healthcare – $11,172 per person in 2018.[4]

To find an alternative path, there has been a growing move toward 'value-based care' – an approach that focuses on prevention and reimbursement, with incentives to ensure people to minimize the amount of people who become ill.

A snapshot of healthcare around the world

What's driving change?

There are more people, and they're getting older.

The global population is projected to reach 8.5 billion by 2030 and 9.8 billion in 2050. Significantly, this population is also ageing: by 2025, an estimated 300 million more people will be over 65, taking the total to 840 million. Older people will account for 11% of the global population and 21% of the European population within a few years.

This brings with it a range of challenges for the healthcare system as a whole; the annual spend on geriatric care is expected to exceed $1.4 trillion by 2023.[5] It will also have an impact on clinicians in particular. In the survey, 84% of clinicians agreed patients with age-associated diseases will make up the majority of the patient population in the future. Agreement was higher in Europe, where 87% identified age-associated diseases as a key driver for change.

Statement: Patients with age-associated diseases will make up the majority of the patient population in 10 years

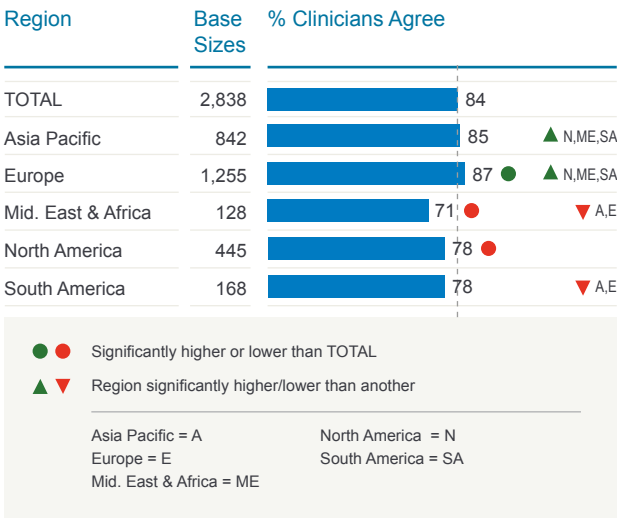


Fig 23: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % clinicians that agree: Patients with age-associated diseases will make up the majority of the patient population.

Clinicians will need the resources, skills and time to treat older patients effectively, and they are likely to encounter mental health issues like loneliness.[6] The rise in mental health problems among the general population was identified by 91% of clinicians in the Clinician of the Future survey as a key driver for change.

Environmental factors also have an influence on healthcare in the future, and therefore the role of the clinician. For example, antimicrobial resistance (AMR) is a growing concern and already results in 700,000 deaths per year, increasing to an expected 10 million deaths per year by 2050.[7] Clinicians will play an important role in curbing the rise of antimicrobial resistance; in the Clinician of the Future survey, 86% of clinicians around the world (93% in China) identified this as a key driver of change.

Possibly the biggest driver of change and largest cause of mortality today is noncommunicable diseases (NCDs). NCDs lead to the loss of 3.4 million potential productive life years in EU countries and account for more than 70% of health costs in the OECD. In Europe, NCDs account for nearly 86% of deaths and 77% of the disease burden.[8]

The World Health Organization (WHO) estimates that in 2019, 32% of global deaths were due to cardiovascular diseases (CVDs) – almost 18 million people.[9] In 2019, diabetes directly caused 1.5 million deaths worldwide[10] and is expected to affect 578 million people by 2030.[11] The picture is similar for many other NCDs, which caused almost three-quarters of all deaths globally in 2019. And it's getting worse: over the last two decades, deaths from ischemic heart disease increased by more than 2 million a year to almost 9 million in 2019.[12]

As the incidence of disease increases, so does the number of people living with chronic diseases, placing additional burden on clinicians. Indeed, the rise of chronic diseases was identified by 94% of survey respondents as a key driver for change in healthcare. And the complexity of health problems is expected to be a rising factor too – in the Clinician of the Future survey, 71% of clinicians agreed there will be an increase in comorbidities among younger patients in 10 years.

Chronic degenerative diseases are largely avoidable. In 2017, almost 3 million premature deaths across OECD countries – more than one-quarter of all deaths – could have been avoided through better prevention and health care interventions.[13]

Today's healthcare system is designed to address the biological factors, while the rest is left to policy. But today's clinicians are keen to think more broadly about how to help their patients be healthy. This disparity is helping shift healthcare more toward a preventive approach.

We're moving toward patient-centered care...

For a preventive approach to be successful, the patient needs to be actively involved in their own health, and this requires a new way of looking at roles. Traditionally, the physician had a leadership role and gave directions to nurses. Information inequality – both between physician and nurse, and physician and patient – meant the physician was often placed on a pedestal as the guardian of healthcare.

Digital technology and the internet are helping shift the paradigm. Patients can monitor their own heart rates, count their steps, log their nutrition and track their sleep using a smartphone, and even have their genomes analyzed without the involvement of a clinician. The data patients can collect about themselves and their health condition from apps and devices has the potential to give them a better picture of their own health than their clinicians have. And they are equipped with sufficient information to self-diagnose at the click of a button. Indeed, clinicians expect patients will be rewarded for looking after their own health. (Read more about the empowered patient in Chapter 1: The Future Clinician as a Partner for Health on page 11).

This traditional structure is already evolving, and the change is contributing to a more collaborative approach to patient care. Today, nurses are taking on more responsibilities in coordinating or management roles.[14] The patient is becoming more empowered to manage their own health, with support from a multidisciplinary team.

As the patient takes on more responsibility for their health, they may begin to see their clinicians' roles differently. In the Clinician of the Future survey, 41% of respondents agreed that in 10 years they will be less valuable to patients than today.

Patents are already starting to take control of their role in the move to a new approach to healthcare. In Project Apollo, "highly motivated patients with common experiences of undiagnosed conditions, a lack of clear treatment options, and shared frustrations with navigating the U.S. healthcare system" conducted a study on how to shift the health paradigm. They concluded that a combination of self-study, community support and digital health tools could help shift "sickcare toward patient-partnered healthcare."[15]

... and this is driving a preventive approach

The WHO already considers the role of a health system more broadly, to include "less visible tasks such as the prevention and control of communicable disease, health promotion, health workforce planning and improving the social, economic or environmental conditions in which people live."[16]

This total health view of healthcare favors a preventive approach. As noted by the clinicians interviewed in the Clinician of the Future study, by being increasingly empowered, patients are encouraging this shift – in partnership with their clinician, they could anticipate likely conditions or exacerbations from their own data and take action to lessen their risk. For clinicians, this could mean more time with patients and therefore the opportunity to develop stronger relationships.

The vaccine program that was swiftly developed in response to the COVID-19 pandemic has re-emphasized the importance of this approach: preventing coronavirus infections with effective vaccines is helping to alleviate the burden on intensive care units in hospitals. It's clear that for many infectious diseases (including measles and polio, as well as COVID-19) that the best approach is to vaccinate to prevent infection in the first place.

There are already moves to prepare for a broader shift in this direction. As Director of the European Alliance for Personalised Medicine Denis Horgan and colleagues wrote in an editorial, "The direction of travel in Europe is plain: towards a holistic approach, greater emphasis on healthy lifestyles and prevention, in search of improved public health in coming years – with the prospect of earlier identification of disease, earlier treatment, and improved quality of life."[17]

In the USA, CDC Prevention Research Centers (PRCs)[18] have been set up to carry out research across themes including diabetes and HIV, to provide a foundation of empirical data on which to base effective preventive healthcare.

Many governments are leading interventions and providing incentives to move to more proactive, preventive healthcare, noting the positive effect on public health. This is having an impact on clinicians' roles already, pushing them to a more 'public health' role.

The future: total healthcare

The Clinician of the Future will work in a more integrated, "total health" system that focuses on preventive care. Our current 'sick' care system will have transformed into a true healthcare system, with financial incentives aimed at ensuring people remain healthy, as outlined earlier in this chapter.

The focus will be on preventive measures in healthcare delivery, such as vaccines, genetic testing, and actions or treatments that boost vitality and wellness, including immunity. National vaccination and screening programs will act as the foundation.[19]

In the Clinician of the Future survey, the majority of respondents expect some form of mandatory measures to be introduced in order to ensure participation, though this differs depending on location. About 80% of clinicians in China expect a much higher proportion of patients will attend regular mandated health check-ups in the future – substantially higher than the total average (56%). In the UK, however, fewer clinicians expect this: only 37%.

> *"We are healthcare providers not disease care providers."*
>
> *Dr Pandiyan Natarajan, India and USA, who participated in the discovery interviews for the Clinician of the Future study.*

The COVID-19 pandemic has accelerated the move towards a more preventive and "total health" approach, with many clinicians reporting discussions with their patients being broader than usual to take stock of the mental toll of the situation. But as the pandemic progresses, it's unclear whether healthcare systems around the world will reverse changes made.[20]

Whatever systemic changes are happening, clinicians believe that patients are already taking steps towards a preventive health approach overall (see Chapter 1: The Future Clinician as a Partner for Health on page 11). Clinicians also expect incentives to be available to promote this in the future: 60% of clinicians believe patients who demonstrate that they actively maintain their health will be rewarded with lower health insurance. Going even further, 46% think patients who demonstrate that they actively maintain their health (for example via wearables) will be given preference for treatment (such as surgery or medication).

Statement: A much higher proportion of patients will be attending mandated regular health check-ups

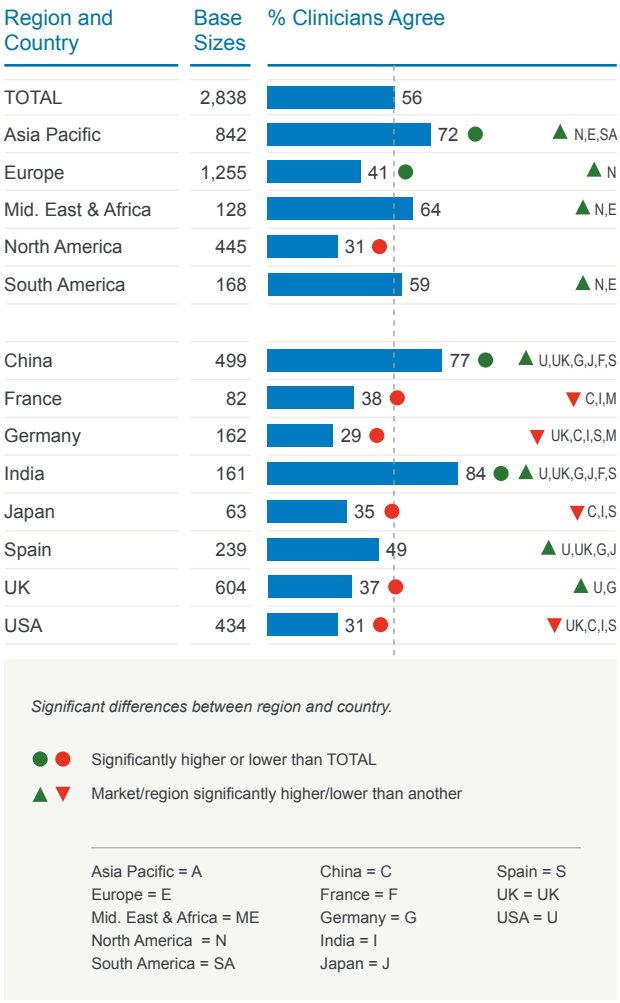


Fig 24: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % clinicians that agree: A much higher proportion of patients will be attending mandated regular health check-ups.

However, this may be challenging for many patients and their healthcare teams. Clinicians in the USA expect patients in many areas to find it difficult to focus on their long-term health. They note that socioeconomic factors affect behavior and may lead to people favoring short-term gains. This could exacerbate the problems with access to health (see Chapter 5: The Future Accessible Clinician on page 92).

Part of a new-look multidisciplinary team

Clinicians who took part in the Clinician of the Future study expect to operate within wider multidisciplinary care teams in 10 years – teams that expand on today's setup to include specialists such as data analysts (see Chapter 3: The Future Tech-Savvy Clinician on page 51). Structured with the patient at the core, in a coordinating role, using data the patient can also access, the team works in partnership to make health recommendations and develop treatment plans where needed. (See more in Chapter 1: The Future Clinician as a Partner for Health on page 11).

The central clinical team is based at a traditional healthcare location, though they are mobile and able to work with patients at home either remotely or in person. Many clinicians (46%) expect the majority of healthcare will be provided in a patient's home instead of a healthcare setting.

1992

Location: hospital
Physician in a director role
Nurses following instructions
Clinicians hold patient data and share important results

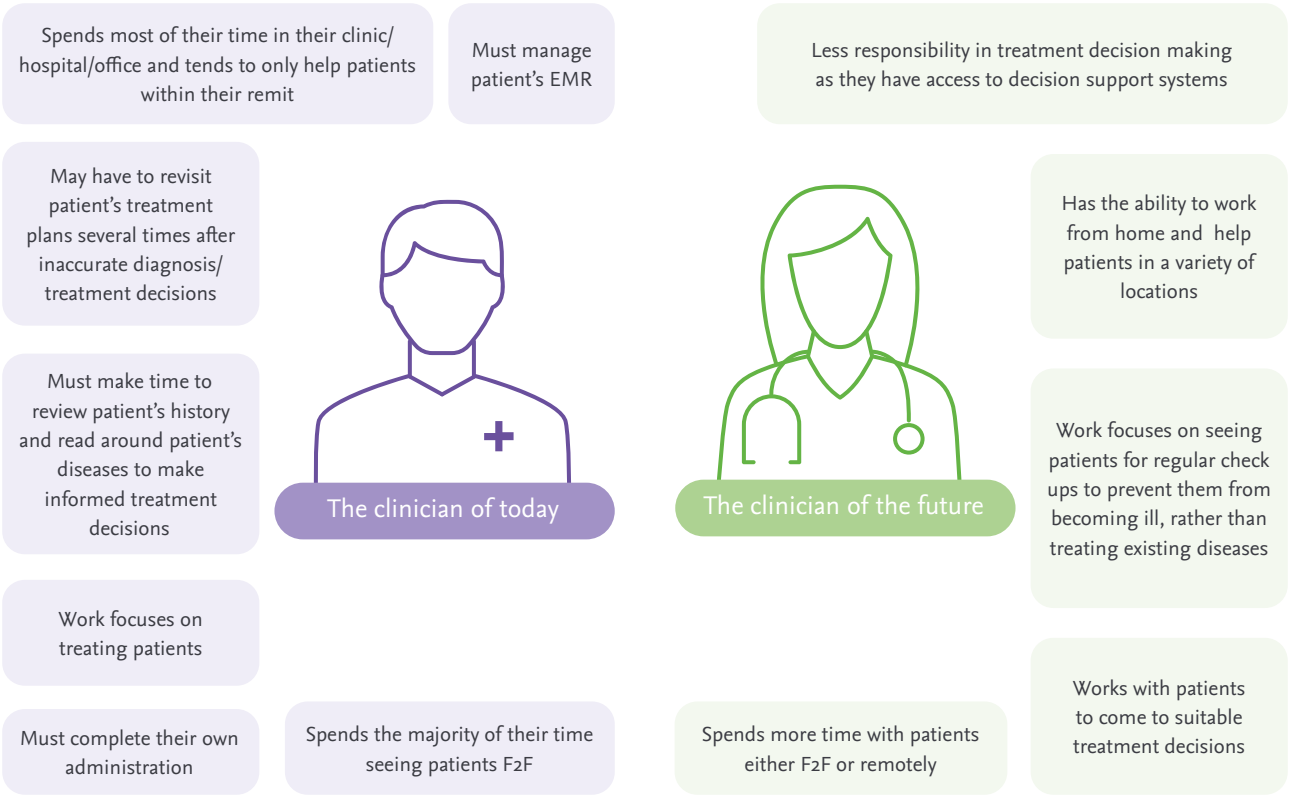
2022

Location: hospital, local centers
Nurse in a manager role
Physicians, nurses and other healthcare providers working together
Clinicians manage patient data and share all results

2032

Location: patient's home, hospital, and local centres
Patient in a coordinator role
Multidisciplinary care team activated to support patient and make joint decisions
Patient can access their data and discuss with clinicians

The clinicians of the future will likely have different responsibilities than they do now.



A health community working in harmony

The collaborative approach will need to extend beyond the care team and throughout the healthcare system. The administrative burden clinicians experience today due to the numerous financial structures they need to navigate, especially in the USA, will be eased by more integration. 83% of clinicians believe that over the last 10 years there has been a much greater need for them to understand the economics of healthcare (e.g. costs), and 68% indicate there is too much focus on cost rather than care.

There is an expectation of better alignment between all the stakeholders involved in the delivery of healthcare – patient groups, government, insurance providers, healthcare providers and institutions, employers, electronic health (or medical) record (EHR or EMR) vendors, payers and more. This will help clinicians make shared decisions with their patients about their wellbeing and treatment that will lead to better outcomes.

The lines between these stakeholders have blurred, too. Competition between new players like Amazon and Apple, previously rooted in the technology space, has pushed a consumer approach to patient care, incorporating personal health data. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

How do we get there?

It sounds like a utopia – a healthcare system that actually keeps people healthy and does not push clinicians into burnout, is affordable and accessible and puts people in charge of their own wellbeing. In 1966, Edward Llewellyn Thomas wrote: "Health is more than the absence of disease… the good physician of the future should be occupied with increasing his patients' physical and mental well-being above our present rather unhealthy norms, as well as with the age-old struggle against dirt, disease and death."[21]

In 1979, sociologist Aaron Antonovsky proposed the Salutogenic Model of Health (SMH), with a focus on the connection between stress, health and wellbeing. He coined the word 'salutogenesis' (*saluto* meaning the origins, *genesis*, of health) to focus on what he considered one of the most important questions facing us: How do we manage to stay healthy?[22]

Clinicians see several paths to a total healthcare system: a complete overhaul, a change in medical education, and clinician-informed policy.

A total overhaul of the system

Today's healthcare systems have evolved into what they are through incremental changes – the digitalization of medical records, the emergence of new specialties and new technologies, changes in financing. Incremental changes can sometimes benefit one part of the system – for example, financial changes may benefit institutions but not necessarily clinicians or patients. Clinicians highlighted the cumulative effects – 89% of clinicians in the Clinician of the Future survey identified cost containment measures taken by hospitals or clinics as a key driver of change over the last decade, while 78% identified payer involvement in healthcare (e.g. insurance companies) as such.

To reach the preventive, total healthcare clinicians foresee, experts suggest we may need to rethink the whole system. According to the clinicians interviewed in the Clinician of the Future study, a possible first step could be for stakeholders involved to look at what is needed – first ask why. Then a reflection on how it could be achieved, without relying on the way things have always been done, could help drive sustainable change.

Take funding, for example. In the USA, the funding model focuses on illness: someone breaks their arm, funding is provided to mend it. If a healthcare system were built around preventive care, this funding model would need to change. Deloitte predicts a value-based outcome approach to funding to support a future for healthcare incorporates the four Ps: predictive, preventive, personalized and participatory.[23]

In all areas, the approach will depend on the current system, and clinicians recognize that the time taken to alter each market's approach will differ. Countries have different health systems that range from private to publicly funded universal healthcare (see examples on page 40). While some are flexible and adaptable, others are more rigid.

Whatever the approach, it will likely need to involve clinicians, and they will potentially lead the change. This may require a rethink of leadership in medicine. Clinicians noted that a balance is needed between administrative managers and senior physicians.

"For the longest time, doctors are taught in medical schools, nurses are taught in schools, computer scientists and engineers are taught in some technical schools. And that's not the way the world operates. The world will always have them working with each other, but we don't train them that way."

Dr Leo Anthony Celi, USA, who attended the Clinician of the Future US roundtable.

Education to train medical leaders

Education will be key in this change. There was extensive discussion about education among key opinion leaders from around the world in the roundtables conducted as part of the Clinician of the Future study in the USA, UK and China. They identified education as a key area of intervention, noting that there is a lot of untapped intellectual and social capacity for change, particularly in young students. It is also critical for developing the range of skills, including leadership, that clinicians will need for their roles to shift to preventive, total healthcare.

Medical education was traditionally designed to teach clinical knowledge and skills. However, as long ago as 1990 there was a realization that this is not enough for clinicians to "function adequately in the workplace."[24] There has since been a rolling evolution, and education is increasingly becoming competency-based, which is focused on outcomes rather than process.[25] There is also a trend towards delivering training to teams rather than individuals, which could mean multidisciplinary care team learns together even more in the future.

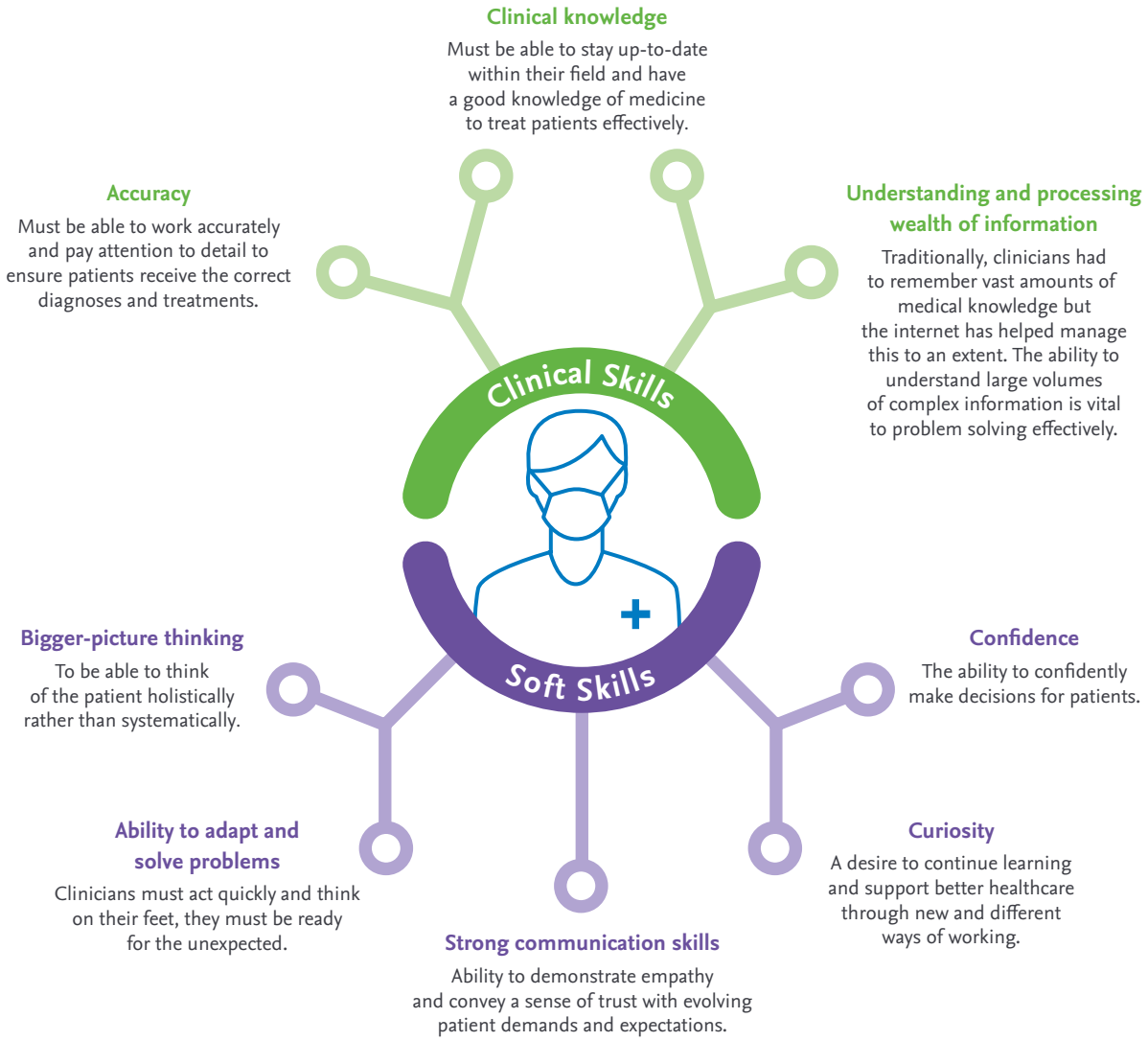
Medical education will need to evolve further to ensure clinicians have the skills and competencies they need for the future of healthcare.

The Clinician of the Future requires a myriad of clinical, soft and technological skills to be successful in the dynamic virtual healthcare environment. In the roundtable discussions for the Clinician of the Future study, key opinion leaders discussed specific areas:

- **Clinical knowledge**
  One of the key priorities clinicians identified for the future is an increased emphasis on needing to stay up-to-date with clinical knowledge. In a more preventive system, this could include education on how to promote health and prevent disease among their patient populations; clinicians could learn how to help patients stay well through nutrition, physical activity and wellness.
- **Data and technology**
  An ability to effectively use technology and understand data analytics will be crucial (see Chapter 3: The Future Tech-Savvy Clinician on page 51).
- **'Soft' skills**
  Interpersonal skills like communication and empathy will be just as important in the future, with the added dimension of digital technology. More focus on bigger-picture thinking in medical education could support clinicians in their approach to total health.
- **Business and leadership**
  In the survey, 83% of clinicians agreed there has been a much greater need to understand more about the economics of healthcare, and this need is unlikely to diminish. The number of combined MD/MBA programs grew from six in 1993 to over 50 in 2015.[26]

"Clinicians who can communicate to the workforce in an engaging and understandable way will have more buy in from the team members."

Dr Gemma Stacey, UK, who attended the Clinician of the Future UK roundtable.



Current Skills	Future Skills
Clinical knowledge	Technology literacy
Communication skills	Clinical knowledge
Teamwork	Data analytics / Statistical knowledge
Empathy	Communications skills
Critical thinking	Teamwork
Time management	Critical thinking
Technology literacy	Time management
Initiative	Initiative

Again, in established medical education systems, change could be challenging. In the roundtables held for the Clinician of the Future study, key opinion leaders noted that there is pushback when new content is proposed for training, sparking the question, 'what do we take out?' One answer is radical: don't take anything out.

William Tierney, MD, professor and chair of Dell's Department of Population Health, told the AMA:[27] "We're trying to get upstream from the things we see every day in our practices, focusing on health promotion and disease prevention. I want us to see a new patient presenting with type 2 diabetes mellitus as an abject failure. Because it's a preventable disease."

To encourage the move to a more comprehensive medical curriculum, the American Medical Association (AMA) supports the integration of Health Systems Science (HSS).[28] Many universities are already doing this, incorporating collaboration, high-value care, leadership, population health, systems thinking and teamwork into their programs.[29]

For example, in 2016, Dell Medical School at the University of Texas at Austin[30] opened its doors with a curriculum that emphasizes value-based care, quality improvement, equity, leadership and teamwork and trains clinicians on health systems science, distributed leadership, health systems scholarship, health informatics, policy, economics and health equity.[31]

Yet in an evaluation of 24 medical curricula from around the world, only four mentioned a health systems approach.[32] Fully incorporating HSS into medical education will require transformational innovation[33] and collaboration between a range of stakeholders, including clinicians, educators and regulators.[34]

Frameworks for medical education

- The Medical Leadership Competency Framework (MLCF) – a framework established collaboratively for the NHS to outline key competencies for leadership in clinicians. [35]
- The CanMEDS Framework – a framework of the abilities physicians need to meet their patients' needs, which features seven archetypes.[36]

Bringing healthcare and policy closer together

Government policies are important for how healthcare is delivered – 89% of respondents to the Clinician of the Future survey agreed policies are a key driver of change, and most agreed governments will be largely responsible for the overall shift in approach to preventive, total care. Health needs to be included in policy throughout many areas, including in innovation and everyday actions.[37]

Educating the public will be an important element of the change, and governments will likely need to lead this through campaigns and intervention. Depending on the context, they may also incentivize good health, for example with vouchers earned by eating healthily. In January 2022, the UK government launched a campaign to help parents improve their children's diets.[38] The New Better Health campaign is a multimedia initiative and includes the NHS Food Scanner App to help people make healthy choices.

"I would ask the prime minister to encourage individuals to look after themselves and to focus on their self-care. I would talk to him about the potential of people to be able to manage their own care"

Dr Stan Shepherd, UK, who attended the Clinician of the Future UK roundtable.

Public health will become a greater priority for governments, and this will require a "diverse and well-qualified public health workforce".[39] With skills in public and preventive health, leadership and data analysis, clinicians will be well placed to play a role in policy and public health.

Policy can address one of the major trends affecting healthcare and driving the rise of the preventive approach: the increase in NCDs and related mortality. In the foresight project FRESHER (FORESIGHTAND MODELLING FOR EUROPEAN HEALTH POLICYAND REGULATION), researchers argue that the drivers and trends in noncommunicable diseases (NCDs) should feed into policy. [40] They look at policy affecting NCDs and share four possible future scenarios for policy in the EU. They conclude: "Out of the box thinking is needed to pay tribute to the complexity of future health systems that need to include aspects like equity, literacy, mobility or urban planning."

And clinicians expect to be involved. As mentioned previously, nearly three-quarters of clinicians believe managing public health will become a key priority in their role. This was particularly evident in China, with 85% of clinicians agreeing. They will be required to understand the needs of different patient populations from a public health perspective and be involved in developing effective policy that addresses health concerns like NCDs.

Clinicians in the USA roundtable noted that clinicians are interested in looking at the bigger picture of their work, but they believe it may be difficult to shift to this in the future due to the public health sector being underfunded. The short-termism of politics also has an impact on the timeline of this shift in many countries. In a roundtable held for this research, UK key opinion leaders noted that from a political standpoint there is less of a desire to develop policies that benefit people in the more distant future.[41]

The successful reform to a preventive healthcare system will involve various parties thinking longer term and working together. A more open dialogue between politicians, clinicians and the general public would support this. However, clinicians' involvement in driving the shift to preventive care will depend on changes to their workload, particularly given clinicians expect resourcing issues in the future: 74% of clinicians expect there to be a shortage of nurses and 68% anticipate a shortage of physicians (see Chapter 4: The Future Balanced Clinician on page 73).

"They should put more money in healthcare, help with the digitalization of healthcare to help with doctors' workload and encourage the population to have a focus on prevention rather than treatment. This should be the focus for the future"

Dr Omar Ibrik, Spain, who participated in the discovery interviews for the Clinician of the Future study.

Ideally, clinicians will be supported in this shift by a growing network of stakeholders with the shared aim of transforming healthcare. New players in the market, such as digital technology companies, and healthcare associations and NGOs could all have an impact from different angles, driving change in healthcare together.

"Preventative treatment needs to be improved and should be an urgent goal for all countries around the globe."

Dr Hany Atallah, USA, who participated in the discovery interviews for the Clinician of the Future study.

Today's challenges	Action	Tomorrow's opportunities
➤ Treat illness, not promote health	➤ Redesign the system for preventive care through policy	➤ Patients manage their own health through prevention
➤ Focus on finance	➤ Pivot to value-based care	➤ Clinicians have public health role
➤ Growing, aging population	➤ Empower patients	

Chapter 2: References

1 WHO. WHO Constitution. https://www.who.int/about/governance/constitution

2 National Cancer Institute. Cancer Moonshot. https://www.cancer.gov/research/key-initiatives/moonshot-cancer-initiative

3 Deloitte. Shaping the physician of the future. 2019. https://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/physician-of-the-future.html

4 Centers for Disease Control and Prevention (CDC) National Center for Health Statistics. Health Expenditures. 7 May 2021. https://www.cdc.gov/nchs/fastats/health-expenditures.htm

5 Deloitte. The future unmasked: Predicting the future of healthcare and life sciences in 2025. 2020. https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/life-sciences-and-health-care-predictions.html

6 Age UK. Older people visiting GPs due to loneliness. 15 November 2013. https://www.ageuk.org.uk/latest-news/archive/older-people-visiting-gps-due-to-loneliness/

7 The Economist Intelligence Unit. Healthcare World Outlook. 2019. https://store.eiu.com/product/healthcare-world-outlook/

8 Wepner, B., Giesecke, S. Drivers, trends and scenarios for the future of health in Europe. Impressions from the FRESHER project. 2018. Eur J Futures Res 6, 2. https://doi.org/10.1007/s40309-017-0118-4

9 World health Organization (WHO). Cardiovascular disease factsheet. 11 June 2021. https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

10 World health Organization (WHO). Diabetes factsheet. 10 November 2021. https://www.who.int/news-room/fact-sheets/detail/diabetes

11 International Diabetes Federation. IDF Diabetes Atlas: Ninth edition 2019. 2019. https://www.diabetesatlas.org/upload/resources/material/20200302_133351_IDFATLAS9e-final-web.pdf

12 World health Organization (WHO). The top 10 causes of death. 9 December 2020. https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death

13 OECD. Avoidable mortality (preventable and treatable). 2019. https://www.oecd-ilibrary.org/sites/3b4fdbf2-en/index.html?itemId=/content/component/3b4fdbf2-en

14 Salmond S.W., Echevarria M. Healthcare Transformation and Changing Roles for Nursing. Orthop Nurs. 2017 Jan/Feb;36(1):12-25. https://doi.org/10.1097/NOR.0000000000000308

15 Nebeker C. et al. Using Self-Study and Peer-to-Peer Support to Change "Sick" Care to "Health" Care: The Patient Perspective. Frontiers in Digital Health. 2020. Volume 2. https://doi.org/10.3389/fdgth.2020.00002

16 World health Organization (WHO) Regional Office for Europe. Health systems. https://www.euro.who.int/en/health-topics/Health-systems

17 Horgan D. et al. Propelling Health Care into the Twenties. Biomed Hub. 2020. 5:1-53. https://doi.org/10.1159/000508300

18 Centers for Disease Control and Prevention (CDC). CDC Prevention Research Centers (PRCs). https://www.cdc.gov/prc/index.htm

19 Deloitte. The future unmasked: Predicting the future of healthcare and life sciences in 2025. 2020. https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/life-sciences-and-health-care-predictions.html

20 Alicea, J. Caring for the Patient: A Shift to Holistic, Integrative Care Post-Pandemic. HCP Live. 11 March 2021. https://www.hcplive.com/view/caring-patient-shift-holistic-integrative-care-post-pandemic

21 Thomas, E. L. The Physician of the Future. Canad. Med. Ass. J. 9 April 1966. Vol. 94. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1935401/pdf/canmedajo1159-0045.pdf

22 Vinje H.F., Langeland E., Bull T. Aaron Antonovsky's Development of Salutogenesis, 1979 to 1994. In: Mittelmark M. et al. (eds) The Handbook of Salutogenesis. 2017. https://doi.org/10.1007/978-3-319-04600-6_4

23 Deloitte. The future unmasked: Predicting the future of healthcare and life sciences in 2025. 2020. https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/life-sciences-and-health-care-predictions.html

24 Neufeld V.R. et al. Educating future physicians for Ontario. Acad Med. 1998. Nov;73(11):1133-48. https://doi.org/10.1097/00001888-199811000-00010

25 Van der Lee, N. et al. The curriculum for the doctor of the future: messages from the clinician's perspective. Med Teach. 2011. 33(7):555-61. https://doi.org/10.3109/0142159X.2011.578176

26 Chang A., Ritchie C. Patient-Centered Models of Care: Closing the Gaps in Physician Readiness. J Gen Intern Med. 2015. Jul;30(7):870-2. https://doi.org/10.1007/s11606-015-3282-x

27 Smith, T. M. Health care and population health: A team sport. AMA. 2 October 2016. https://www.ama-assn.org/delivering-care/public-health/health-care-and-population-health-team-sport

28 AMA. Accelerating Change in Medical Education: Teaching Health Systems Science. https://www.ama-assn.org/education/accelerating-change-medical-education/teaching-health-systems-science

29 Gonzalo, J.D. et al. General Internists as Change Agents: Opportunities and Barriers to Leadership in Health Systems and Medical Education Transformation. J Gen Intern Med. 2020. 35, 1865–1869. https://doi.org/10.1007/s11606-019-05611-5

30 Dell Medical School. Advancing Care Transformation. Dell Medical School. https://dellmed.utexas.edu/education/academics/graduate-medical-education/advancing-care-transformation

31 Barbaro, N. M. et al. Advancing Care Transformation: Our Approach to Graduate Medical Education. Dell Medical School. 30 September 2021. https://dellmed.utexas.edu/blog/advancing-care-transformation-our-approach-to-graduate-medical-education

32 Webb, A. et al. A First Step Toward Understanding Best Practices in Leadership Training in Undergraduate Medical Education: A Systematic Review. Academic Medicine. November 2014. Volume 89, Issue 11, 1563-1570. https://doi.org/10.1097/ACM.0000000000000502

33 Gonzalo, J. D., Wolpaw, T., Wolpaw, D. Curricular Transformation in Health Systems Science: The Need for Global Change. Academic Medicine. October 2018. Volume 93, Issue 10, 1431-1433 https://doi.org/10.1097/ACM.0000000000002284

34 Gonzalo, J. D. et al. Concerns and Responses for Integrating Health Systems Science Into Medical Education. Academic Medicine. June 2018. Volume 93, Issue 6, 843-849. https://doi.org/10.1097/ACM.0000000000001960

35 NHS Institute for Innovation and Improvement and Academy of Medical Royal Colleges. Medical Leadership Competency Framework. 2010. https://www.leadershipacademy.nhs.uk/wp-content/uploads/2012/11/NHSLeadership-Leadership-Framework-Medical-Leadership-Competency-Framework-3rd-ed.pdf

36 Royal College of Physicians and Surgeons of Canada. CanMEDS: Better standards, better physicians, better care. https://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e

37 Wepner, B., Giesecke, S. Drivers, trends and scenarios for the future of health in Europe. Impressions from the FRESHER project. 2018. Eur J Futures Res 6, 2. https://doi.org/10.1007/s40309-017-0118-4

38 Department of Health and Social Care. New campaign launched to help parents improve children's diet. 10 January 2022. https://www.gov.uk/government/news/new-campaign-launched-to-help-parents-improve-childrens-diet

39 Deloitte. The future unmasked: Predicting the future of healthcare and life sciences in 2025. 2020. https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/life-sciences-and-health-care-predictions.html

40 Wepner, B., Giesecke, S. Drivers, trends and scenarios for the future of health in Europe. Impressions from the FRESHER project. 2018. Eur J Futures Res 6, 2. https://doi.org/10.1007/s40309-017-0118-4

41 Niemietz, K. Diagnosis: Overrated – An analysis of the structural flaws in the NHS. Institute of Economic Affairs. 4 December 2015. https://iea.org.uk/publications/research/diagnosis-overrated-an-analysis-of-the-structural-flaws-in-the-nhs

Clinician of the Future

Chapter 3

The Future Tech-Savvy Clinician

ELSEVIER

Health

Redefining the care team for the digital era

Meet the future tech-savvy clinician.

The clinician of the future works in a system that is dependent on digital technology, and positively transformed as a result. Day to day, most of their consultations are virtual, and they use interoperable digital health software to manage patient communication, maintain patient records and help them make clinical decisions. They have all the data they need at their fingertips, and technology that uses artificial intelligence to highlight the most relevant information. Although they need to keep up with fast-changing tech, the clinician of the future has time for professional development and to build confidence in new digital approaches, including through developing empathy in a digital setting.

Today	Drivers of change	The future	Action
The digital era is here: 88% of clinicians globally agreed that being technologically savvy is more important in a clinician's daily role today than it was a decade ago. **Data overwhelm:** 69% of clinicians agreed that the volume of patient data is overwhelming. **Inefficient EMR:** Clinicians noted frustrations with the electronic medical record (EMR), which they believe is an administrative burden.	**Big Data are getting bigger:** The volume of data created, captured, copied and consumed globally is expected to reach 181 zettabytes in 2025.[1] **COVID-19 has accelerated tech:** Public interest in telehealth increased during the pandemic, according to an analysis of Google Trends™.[2] **Empowered patients:** Technology and data are empowering some and reducing access for others.	**Digital transformation:** 70% of clinicians agreed the widespread use of digital health technologies will enable the positive transformation of healthcare, and 63% expect most consultations to be remote in 10 years. **Not all positive:** 69% of clinicians agreed digital health technologies will be a challenging burden, and 64% agreed the impact of health inequalities will be exacerbated by digital tech. **Artificial intelligence (AI):** 56% of clinicians expect they will make most decisions using clinical decision support tools that use AI in 10 years' time.	➤ Continuous training that keeps pace with digital developments ➤ Time and headspace to learn and master new skills and tech ➤ Person-centered digital design ➤ Regulation for safety, security and quality

Unless otherwise stated, the figures in this summary table are key findings from the Clinician of the Future survey, conducted with n=2838 clinicians.

The dawn of the digital health revolution

Digital technology has undoubtedly had an impact on clinicians' roles already. In the Clinician of the Future survey, 88% of clinicians agreed that being technologically savvy is more important in a clinician's daily role today than it was a decade ago.

Statement: Being technologically savvy is more important in a clinician's daily role

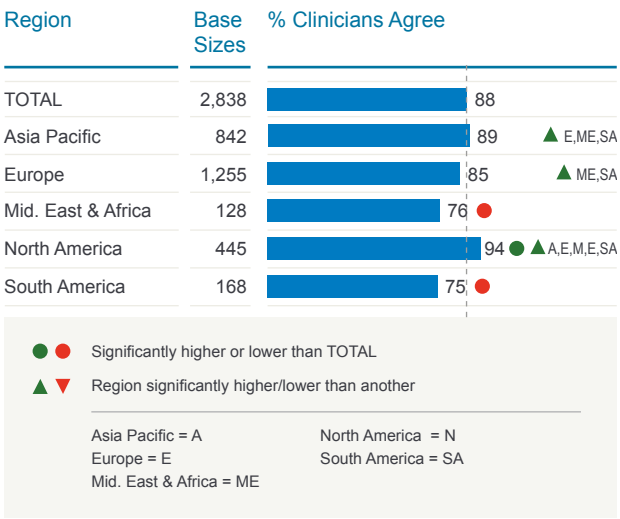


Fig 25: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare. Shows % of respondents that agree with statement: Being technologically savvy is more important in a clinician's daily role.

The digitalization process and the move to more applicable data analysis is evolutionary rather than revolutionary. For example, medical records have been kept systematically on paper since the early 20th century, and the emergence of computers in the 1960s and 70s paved the way for them to go digital.[3]

Clinicians are used to working with data and technology: they already understand biometric data for monitoring patients, for example, and they use these data skills on a daily basis. And many different data types are stored in the EMR, providing vast amounts of information for clinicians to make a diagnosis and treatment plan.[4]

Clinicians use data, but it can be overwhelming

This continues to evolve: information is coming from a growing number of data sources. While previously clinicians might have analyzed ECG data and blood test results, they now have access to a vastly expanded amount of patient data. Imaging data from fMRI scans, genomic analyses and a battery of blood test data all help paint a picture of a patient's condition.

As the data pool deepens, many clinicians report feeling overwhelmed – in the Clinician of the Future survey, 69% of respondents agreed that the volume of patient data is overwhelming. This was substantially higher in APAC (73%), with particularly high numbers of clinicians in China reporting this (81%).

"An inability to immediately access actionable data pieces from systems creates a real burden for clinicians."

Dr Ian Tong, USA, who participated in the discovery interviews for the Clinician of the Future study.

Statement: The volume of patient data (structured and unstructured) available is overwhelming

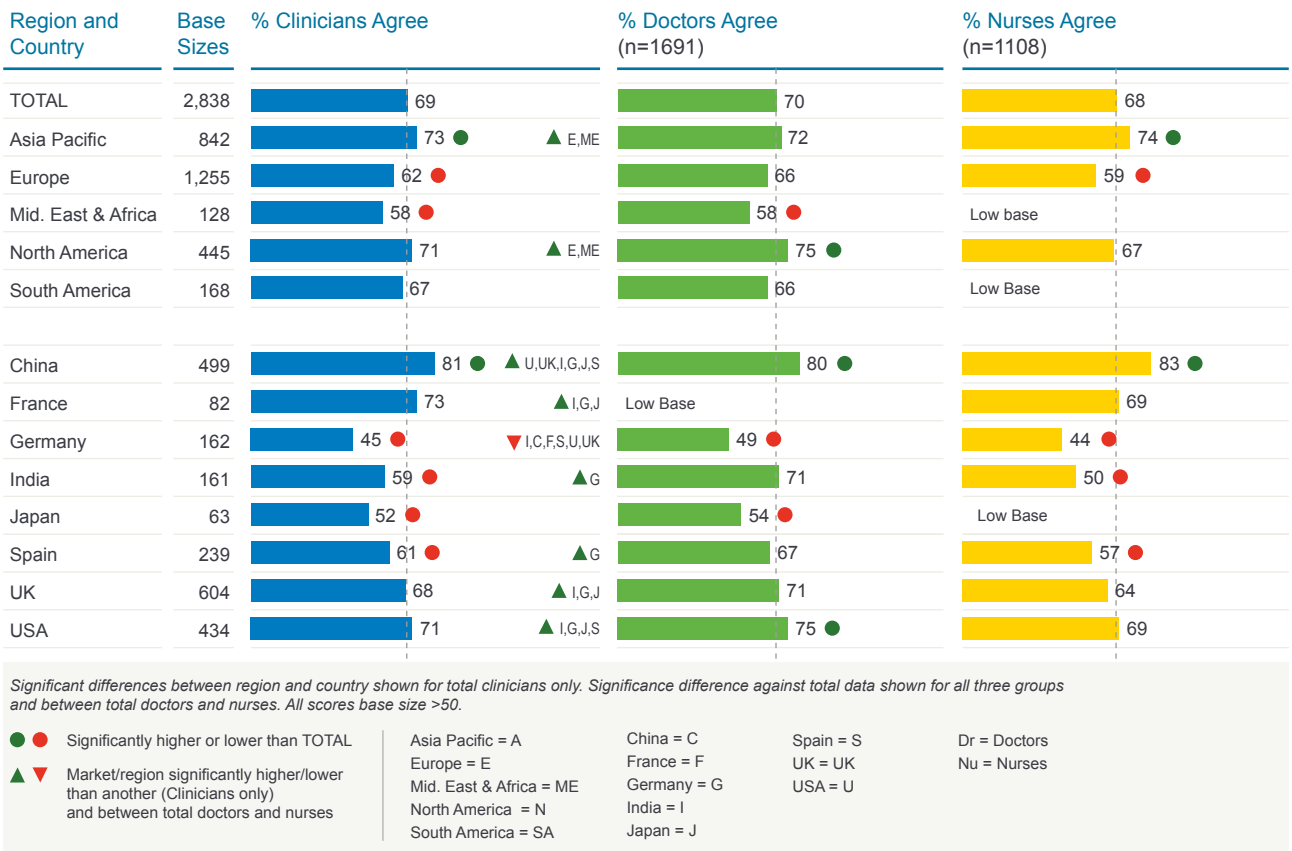


Fig 26: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare?
Shows % of respondents that agree with statement: The volume of patient data (structured and unstructured) available is overwhelming.
For more information on base sizes for doctors and nurses, see Appendix on page 115.

Much of this data comes from the increasing number of tools and technologies available to clinicians and patients. New medical devices[5] are getting smaller and easier for patients to use, providing clinicians with access to a real-time stream of data. Consumer technologies aimed at patients also provide data that clinicians can use to understand a patient's health. By the first quarter of 2021, there were almost 54,000 health apps available in the Apple Store[6] and nearly as many on Google Play.[7]

The Electronic Medical Record (EMR)

One collective point of frustration for today's clinicians is the electronic medical record (EMR) and the connected electronic health record (EHR). The EHR contains all relevant, available data on a patient, including medical history, allergies, family details, test results and personal information. In theory, the data clinicians add to the EMR feeds into this.

EMR, EHR, PHR...

These terms are often used interchangeably, though many sources refer to certain features and differences.[8]

- The electronic health record (EHR) contains information about the health of a patient or population over time.
- The electronic medical record (EMR) contains information about specific visits, including tests, diagnoses and treatments, that clinicians complete and that feed into the EHR.
- The personal health record (PHR) is controlled by the patient and contains personal medical data they can share with clinicians.

In many systems, one of the main functions of the EMR is billing. The EMR also functions as a core documentation system, and even a legal source of truth. Because of the many parties invested in its use, there is an incentive to keep EMRs the way they are.

But many clinicians who took part in the Clinician of the Future study view the EMR as more of a hindrance than a help when it comes to patient care. They report that working with the EMR takes time away from patient interaction. Rather than supporting clinicians to treat patients, the EMR demands time and attention that is already in short supply.

"With electronic medical records, the clinician has become the clinician, unit secretary, pharmacist and medical coder."

Clinician, USA, who responded to the Clinician of the Future survey.

"EHR takes away from the patient-doctor connection. There is hardly any 'laying of hands' now."

Clinician, Australia, who responded to the Clinician of the Future survey.

In the US roundtable held as part of the Clinician of the Future study, key opinion leaders noted that clinicians in the USA often feel like they have to tick many boxes and collect a lot of data before they can even consider a diagnosis and treatment. It is a huge challenge to manage the data effectively and efficiently, and because data inputting is a frequent task day to day, it is a huge burden on clinicians' workload. This in turn can negatively affect clinicians' ability to focus on and empathize with the patient.

Consulting from a distance

Clinicians also increasingly use digital technology in their interactions and communication with patients. The COVID-19 pandemic accelerated the existing trend towards more digital appointments with clinicians, especially in primary care. In a study of telemedicine and in-person outpatient appointments of 16.7 million people with Medicare Advantage insurance in the USA, the rate of remote consultations increased from 0.8 to 17.8 visits per 1,000 enrollees in the first six months of 2020.[9]

While telehealth provided a solution to a problem during COVID-19 – giving as many patients as possible continued, safe access to care during lockdowns – it also raises concern among clinicians. In the Clinician of the Future survey, 51% of respondents agreed that telehealth will negatively impact their ability to demonstrate empathy with their patients; more doctors (54%) than nurses (49%) agreed (see Chapter 1: The Future Clinician as a Partner for Health on page 11).

"COVID-19 has accelerated digital transformation dramatically, for a while the only way to deliver care was through Telehealth, and that is just one example. In many respects COVID has introduced digital transformation into the mainstream."

Dr Charles Alessi, UK, who attended the Clinician of the Future UK roundtable.

There are several notable exceptions where fewer clinicians in the survey agreed that telehealth will negatively impact their ability to demonstrate empathy with their patients: China (42%), India (41%) and Japan (38%). This could be a result of the frequent use of virtual consulting in these countries.

Statement: Telehealth will negatively impact clinicians' ability to demonstrate empathy with patients

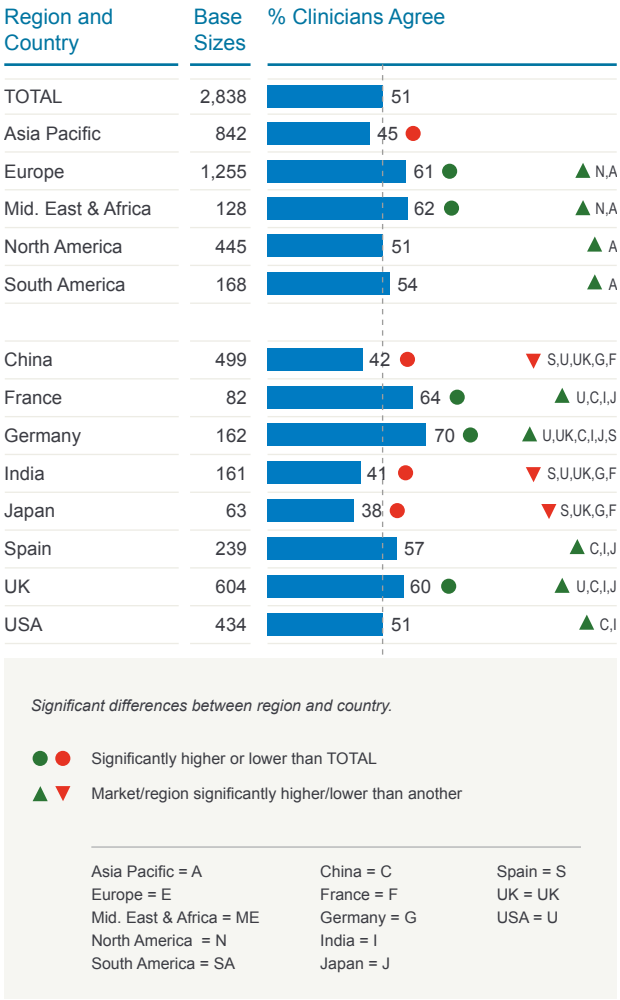


Fig 27: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around Digital Health Technologies in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Telehealth will negatively impact clinicians' ability to demonstrate empathy with patients.

What's driving change?

Big Data are getting bigger

The amount of information is exploding: the volume of data created, captured, copied and consumed globally is expected to almost double from 97 zettabytes in 2022 to 181 zettabytes in 2025.[10] In addition to the biometric and diagnostic data they have used for many years, clinicians have increasing access to population-level Big Data, helping them understand their patients from a different perspective and potentially improve outcomes.

For healthcare providers and government authorities, having this kind of data can help shape public health approaches and accelerate the development of treatments and vaccines. COVID-19 put a spotlight on what is possible: real-time, real-word data were analyzed to track the pandemic.[11] In many countries, Big Data informed authorities' decisions around mitigation efforts.[12]

This focus on data could help define future data use in public health measures, including how it is communicated. Data took center stage during the pandemic, and its use in informing decisions became a more comfortable concept for many patients. For some, the data helped provide a clearer picture of what was happening, including by explaining public health decisions like closing schools and restaurants. Many members of the general public were discussing the latest infection and mortality figures, intensive care capacity and even R numbers over a virtual coffee.

However, for those who are less data literate, the constant flow of numbers could be confusing and even frightening. People with lower health literacy were less able to distinguish credible sources of information, taking on misinformation from sources using the data inaccurately.[13] In this way, the abundance of data and misinterpretation highlighted the gap in health literacy. (See Chapter 5: The Future Accessible Clinician on page 92).

COVID-19 and the emergence of new tech

Digital health technology took a giant leap forward early on in the pandemic, when healthcare providers needed to find ways to treat patients while minimizing the risk of Coronavirus transmission.[14] Telehealth emerged as a way to improve efficiency and enable clinicians to see even more patients in the same amount of time.

"Following COVID we now see more remote consultations. This is reflective of one of the biggest changes in the future for clinicians. A number of remote consultations are on Zoom but most are on the phone. We have always done some appointments on the phone, even before COVID."

Doctor, USA, who responded to the Clinician of the Future survey.

Telehealth isn't new: clinicians have long communicated with patients by phone, and more recently video call.[15] The COVID-19 pandemic spurred the launch and growth of new technologies. For example, in less than a year, video-conferencing software company Zoom went from having 10 million daily users to 300 million.[16]

"I use digital health regularly, especially at the moment because of COVID. I'm sure this will become more and more prevalent in healthcare in the future."

Doctor, Spain, who responded to the Clinician of the Future survey.

A number of clinicians said they thought the use of telemedicine is likely to remain above pre-pandemic levels. Although it had already been in use, in countries like the USA where telehealth wasn't reimbursed pre-pandemic, it was difficult to make remote consulting a sustainable business model. To ensure it remains viable for clinicians in the future, associations are advocating for a sustainable approach; for example, the American Medical Association is urging the US Government to make sure reimbursements continue (see Chapter 2: The Future "Total Health" Clinician on page 35).

"COVID-19 has brought forward the concept of remote consultations now, and this is something new for clinicians to contend with."

Dr Stan Shepherd, UK, who attended the Clinician of the Future UK roundtable.

Tech putting patients first… and last

As well as developing new technologies to support clinician–patient communication, tech companies are getting more deeply involved in healthcare.[17] As well as accelerating innovation, their presence also opens the possibility of partnerships: tech companies bring their expertise in agile product development, ensuring their workforces are set up to launch digital solutions quickly, and by partnering with patients, clinicians and healthcare providers, they are positioned to best ensure the tech meets everyone's needs.

The involvement of tech companies in healthcare is also shifting the role of the patient to become more consumer-like. This is part of a broader trend that is driving change in healthcare: the rise of the empowered patient. Digital technology and data are putting more information in patients' hands, increasing their data needs. (See Chapter 1: The Future Clinician as a Partner for Health on page 11).

However, this is also widening the access gap. In the China roundtable held as part of the Clinician of the Future study, key opinion leaders talked about the generational divide in particular. Many older patients are unfamiliar with technology and unable to benefit from telehealth. The younger generation, who are more familiar with technology and using smart devices to track their health, are reaching the age at which they will encounter more health issues. This will potentially push digital health even more.

The future: More time or greater burden?

The digital future offers great potential for clinicians and their patients. In the Clinician of the Future survey, 70% of clinicians agreed the widespread use of digital health technologies will enable the positive transformation of healthcare. Clinicians in the APAC region and South America were particularly positive: 84% and 77% of clinicians respectively agreed.

"Being adept at technology for a clinician can be difficult, as, in many instances, we have very imperfect ways of managing technology in healthcare."

Dr Charles Alessi, UK, who attended the Clinician of the Future UK roundtable.

Statement: The widespread use of Digital Health Technologies will enable positive transformation of healthcare

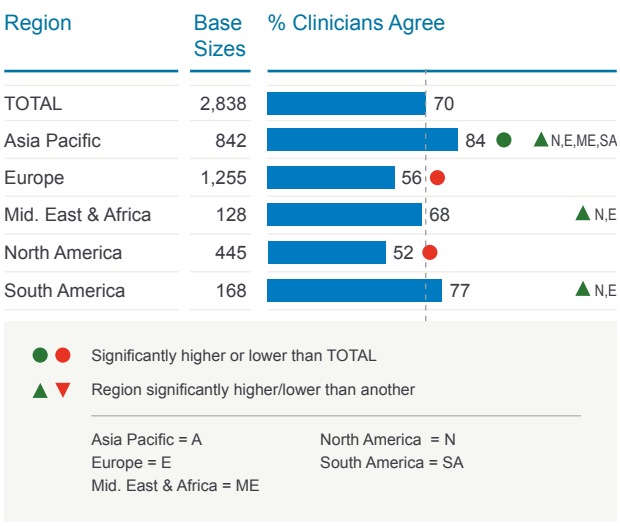


Fig 28: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around Digital Health Technologies in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: The widespread use of Digital Health Technologies will enable positive transformation of healthcare.

As previously mentioned, the use of telehealth is expected to continue. Following a surge in the use of technologies ranging from telephone calls to full virtual services during the COVID-19 pandemic, clinicians expect a future of hybrid healthcare that is online and in-person. If digital health technologies are designed with clinicians and patients in mind, well-integrated and supported by sufficient training, they have the potential to provide many benefits.

Digital technology could save clinicians time spent on administration, enabling them to spend more time with patients, either remotely or face-to-face. If technology is used to improve processes around patient records, clinicians could be freed up from maintaining the EMR.

"Digital health means I don't have to do as much admin, giving me more time to spend with my patients."

Doctor, Spain, who responded to the Clinician of the Future survey.

While respondents to the Clinician of the Future survey were generally positive in their views of the digital future, there was less enthusiasm for the potential of digital health in the USA and Europe. Only 52% of clinicians in the USA and 56% in Europe believed digital technology will enable positive transformation of healthcare. It is worth noting that digital health technology brings with it some disadvantages: 69% of survey respondents agreed it will be a challenging burden for clinicians in 10 years, rising to 80% of clinicians in the USA.

"The previous deficiency is the driver for improvement in China. Nowadays in my hospital, 20-30% of outpatient consultation is done online, and contribute 25% of the income for outpatient clinic"

Participant from the Clinician of the Future China roundtable.

Statement: The widespread use of Digital Health Technologies will be a challenging burden on clinicians' responsibilities

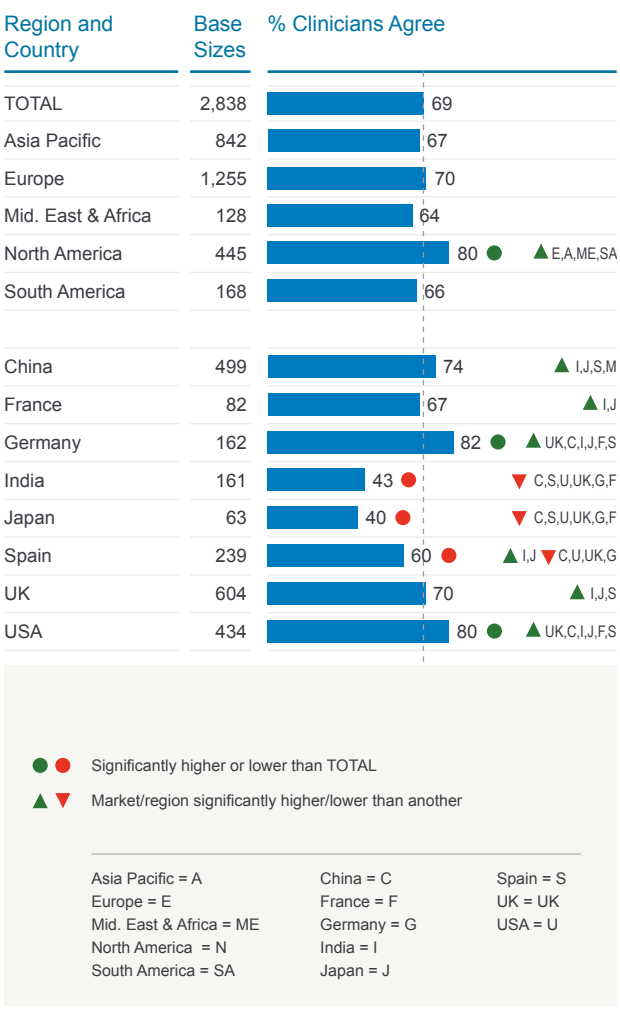


Fig 29: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around Digital Health Technologies in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: The widespread use of Digital Health Technologies will be a challenging burden on clinicians' responsibilities.

There is also concern about the impact of digital technology on clinicians' own roles and health, especially if the processes around integration and training are not smooth. In the Clinician of the Future survey, 67% of clinicians agreed they will need to become experts in the use of these technologies in the future.

Healthcare will be more detached from location

Despite the potential negative impacts, clinicians expect their use of telehealth to rise. In the Clinician of the Future survey, 63% agreed the majority of consultations between clinicians and patients will be remote in 10 years.

In addition to the remote consultation tools used today, including telephone and video software like Zoom, clinicians predict a rise in their use of remote monitoring tools. Survey respondents agreed that 42% of consultations will be offered as a full virtual service in 10 years; those in the USA (51%) and the UK (51%) thought this percentage would be higher.

Statement: Clinician consultations offered as a full virtual service

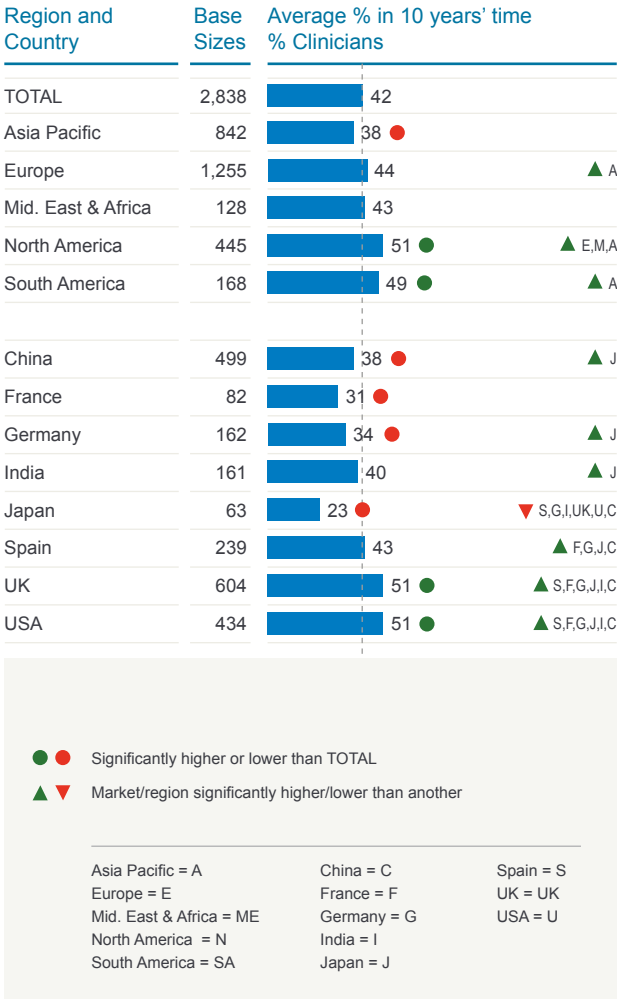


Fig 30: Question: Please consider the following areas and indicate what you think the proportion will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Clinician consultations offered as a full virtual service.

Some clinicians expect chatbots to play a role in triage – automated messaging to guide initial discussions with patients. In the Clinician of the Future survey, clinicians expected that 39% of initial discussions with patients will be managed by chatbots in 10 years' time.

Statement: Initial discussions with patients will be managed by chatbots

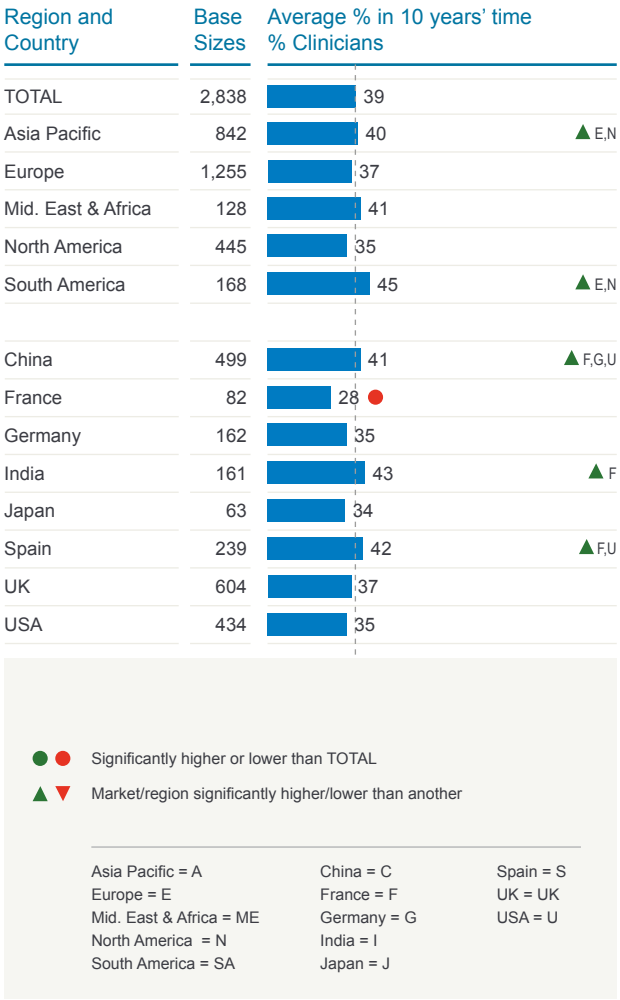


Fig 31: Question: Please consider the following areas and indicate what you think the proportion will be in 10 years' time (in 2031)? Shows average % of: Initial discussions with patients will be managed by chatbots.

As healthcare moves towards remote consultation and monitoring tools, in many cases it could be less important for patients to visit clinicians in person. Those who do need to visit, for surgery, for example, could be discharged earlier and monitored remotely.

"Digitization removes the dependency of data on location and organization. Digitalization breaks the lock between data and location, and that's going to be one of the biggest changes for me. That's one of the biggest impacts that we have already."

Dr Omar Ibrik, Spain, who participated in the discovery interviews for the Clinician of the Future study.

This will support a move to detaching the provision of healthcare from the traditional setting. Indeed, in the survey, 49% of clinicians expect the majority of healthcare will be at patients' homes in 10 years (see Chapter 5: The Future Accessible Clinician on page 92).

Remote robotics

In the future, technology could support inter-institution clinical work. Robotic surgery is already widely used.[18] With digital technology, a surgeon could operate on a patient in another country. This has the potential to help close the health gap globally.

Tech that supports clinical decision making

Clinicians believe technology and data could also support them in diagnosis and treatment decisions, again freeing up time spent looking at medical history and information on different conditions. This includes the use of digital technology as a source of clinical information.

Clinicians expect their clinical skills to exist alongside other equally important skills in the next ten years. In the Clinician of the Future survey, 10% of clinicians ranked data analytics/statistical knowledge in the top 3 skills of today; this rises to 37% in 10 years. Similarly, only 14% of clinicians consider technology literacy to be one of their top 3 critical skills today, increasing to 50% in 10 years.

Statement: Clinicians using medical information apps as a reliable way to stay on top of new developments

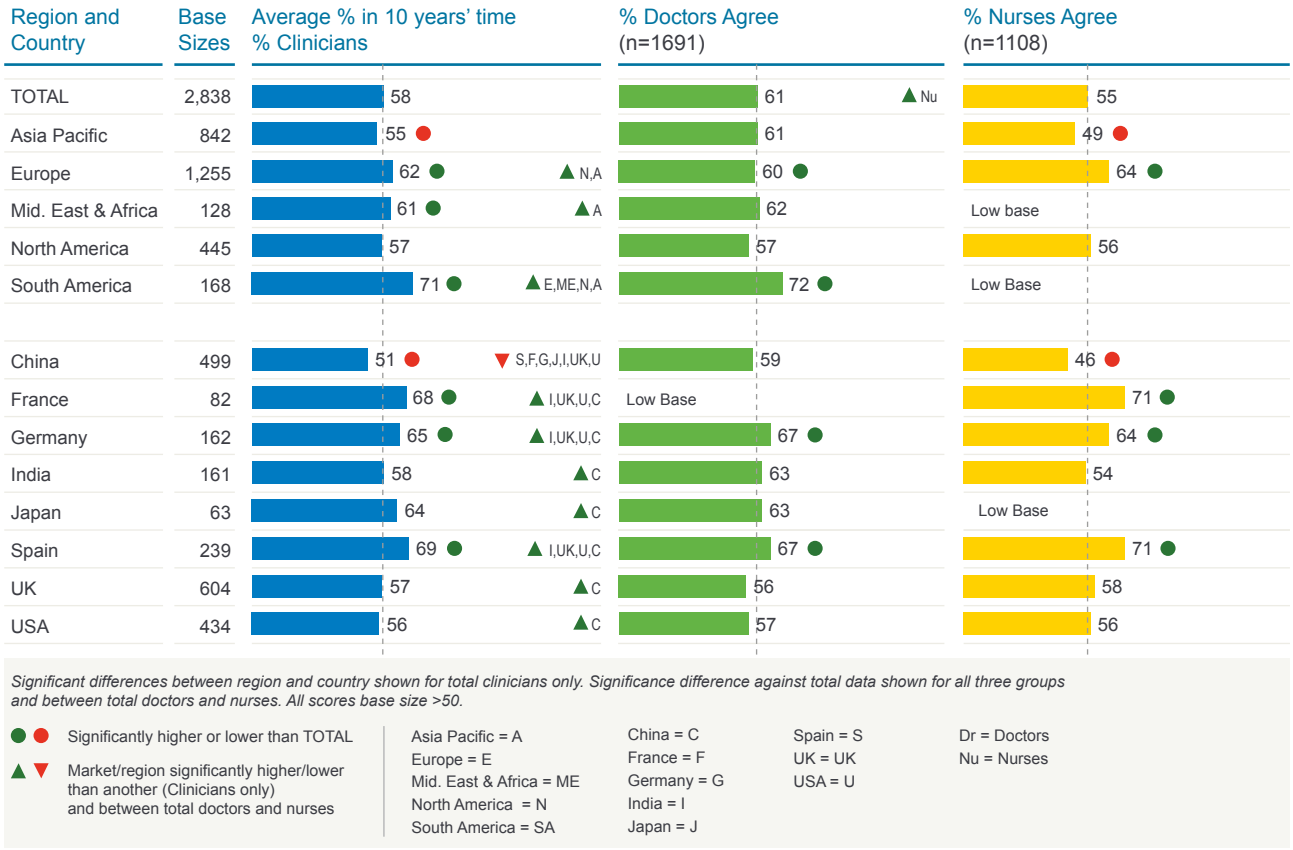


Fig 32: Question: Please consider the following areas and indicate what you think the proportion will be in 10 years' time (in 2031)? Shows average % of: Clinicians using medical information apps as a reliable way to stay on top of new developments. For more information on base sizes for doctors and nurses, see Appendix on page 115.

This application of technology will be increasingly important in the future, as the body of medical knowledge continues to grow. The volume of information combined with increasing specialization is already overwhelming, and clinicians can no longer store everything in their memories. Clinicians expect digital technology to help. In the Clinician of the Future study, respondents expect that 58% of clinicians will be using medical information apps as a reliable way to stay on top of new developments in 10 years. The predicted usage was higher in South America (71%), Europe (62%) and MEA (62%), and higher among doctors (61%) compared to nurses (55%).

This digitalized information could be a core element of digitalized clinical decision support systems (DSS). These systems have the potential to aid clinicians in their decision making, positively impacting their roles by:

- Reducing the knowledge burden on clinicians by providing them with the right information at the right time, enabling them to make a final treatment decision based on the most up-to-date evidence
- Allowing clinicians more time, allowing them to spend more time caring for patients and achieve a better work-life balance
- Allowing for more accurate diagnoses and treatment decisions, increasing trust in clinicians

The age of artificial intelligence (AI)

Clinical information is only one element of the clinical decision-making process, from assessment to diagnosis and treatment. Heuristic knowledge drives decision making, and this can be supported by artificial intelligence (AI) and machine learning prediction models.

Over half of clinicians (56%) expect they will make the majority of their decisions using clinical decision support tools that use artificial intelligence, according to the Clinician of the Future survey. The percentage was substantially higher in APAC (64%), MEA (62%) and South America (64%).

Statement: Clinicians will base the majority of their decisions using clinical decision support tools that utilize Artificial Intelligence (AI)

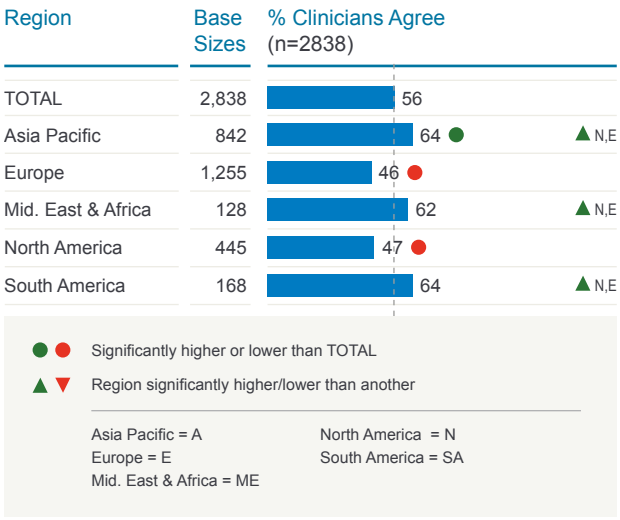


Fig 33: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around Digital Health Technologies in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Clinicians will base the majority of their decisions using clinical decision support tools that utilise Artificial Intelligence (AI).

"Files will be in pieces in different locations; this can lead to a greater burden on clinicians. AI will be needed to put everything together to reduce this burden. It will be great to have 1 main system with all of the doctor's records."

Samah Ahmed, Canada, who participated in the Clinician of the Future student roundtable.

"AI would be useful to help predict patients diagnoses. Patients could type in their symptoms and we could diagnose their conditions using this support system."

Dr Eisa Houshmand, Iran, who participated in the discovery interviews for the Clinician of the Future study.

With AI, a clinical decision support system could put the most relevant information in front of the clinician based on the patient's symptoms, saving the clinician time searching the patient's medical history. The system could also provide a shortlist of possible diagnoses, along with answers to questions the clinician might have about them.

As AI applications continue to evolve, they could play an important role in precision medicine, which relies on understanding the interplay of many different factors. Machine learning could help digital applications assimilate patient data, Big Data – epidemiological and environmental, for example – and information from the latest scientific and clinical studies to support the clinician in building personalized treatment plans.

"The clinician of the future has to be more data savvy and data analytics savvy. However, the way that we have established how we take care of patients, again, comes from a select few who determined that this is the way to diagnose and treat historically."

Dr Leo Anthony Celi, USA, who attended the Clinician of the Future US roundtable.

The EMR of the future

Although many clinicians cite the EMR of today as a major burden on their time, it could transform in the future. In the Clinician of the Future survey, 79% of clinicians agreed the EMR will integrate multiple data sources 10 years in the future, such as genomic data and patient consumer health app data. This expectation was particularly high in China (91%).

Statement: Patient electronic medical records will integrate multiple data sources (e.g. monitoring data from health applications, predictive risks from genome data), providing clinicians with comprehensive patient health information

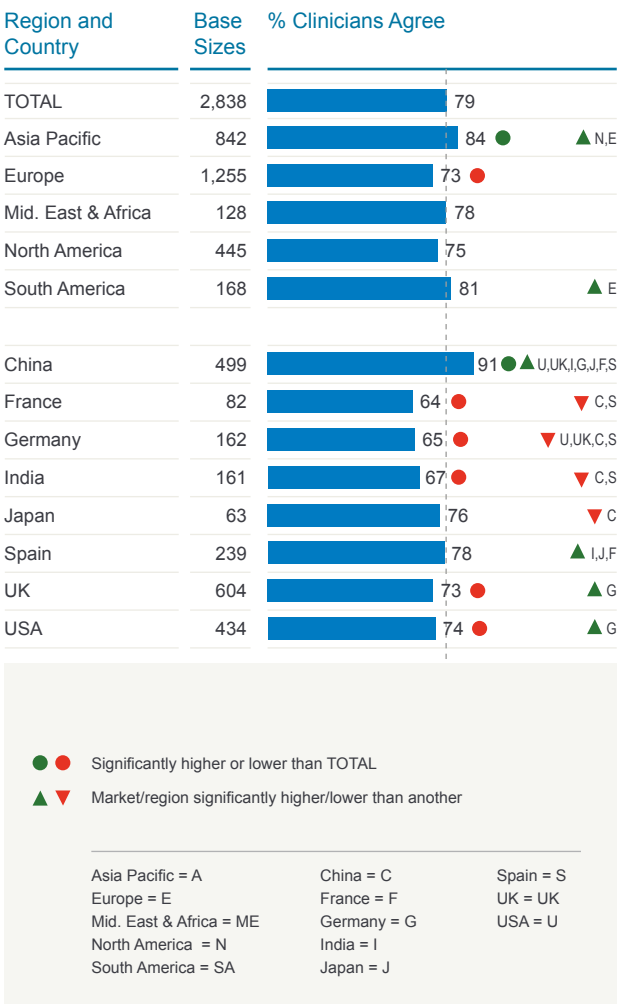


Fig 34: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations around Digital Health Technologies in healthcare in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Patient electronic medical records will integrate multiple data sources (e.g. monitoring data from health applications, predictive risks from genome data), providing clinicians with comprehensive patient health information.

The EMR of the future has the potential to serve as a clinical decision support system. It could provide the clinician with the relevant information before a patient consultation, support the decision-making process and carry out automated check-ins with the patient. At an administrative level, the EMR could be designed to reduce duplication in data entry and improve efficiency. All this would save the clinician time.

A patient has a rash. Here's what their analysis journey might look like with an EMR that integrates a clinical digital support system.

Patient

- Google search: rash on torso
- Uploads a photo for a Google image search
- Mayoclinic.org: looks through photos
- Identifies three possibilities
- Contacts clinician, sharing a photo and suspected diagnoses
- Receives a short survey from clinician and responds
- Receives a prescription electronically

Clinician

- Receives a photo of a patient's rash and three possible diagnoses
- EMR puts relevant history alongside the message – allergies, previous infections
- EMR suggests questions for patient, and clinician generates survey
- Checks responses and suggestion from EMR
- Issues an electronic prescription and sets automatic chatbot check-in for five days later

However, while a more integrated and intelligent EMR would provide clinicians with comprehensive patient health information, it might add to the data overload already being experienced (see Chapter 4: The Future Balanced Clinician on page 73).

Technology, empowerment and equity

The rise of digital health is happening on both sides of the clinician–patient relationship, and technology companies will have a growing stake in the future. Several tech giants – including Apple and Google – are already getting involved in healthcare.[19]

In the Clinician of the Future study, 77% of clinicians agreed technology companies will be key stakeholders in managing healthcare systems in 10 years.

Statement: Technology companies will be key stakeholders in managing healthcare systems

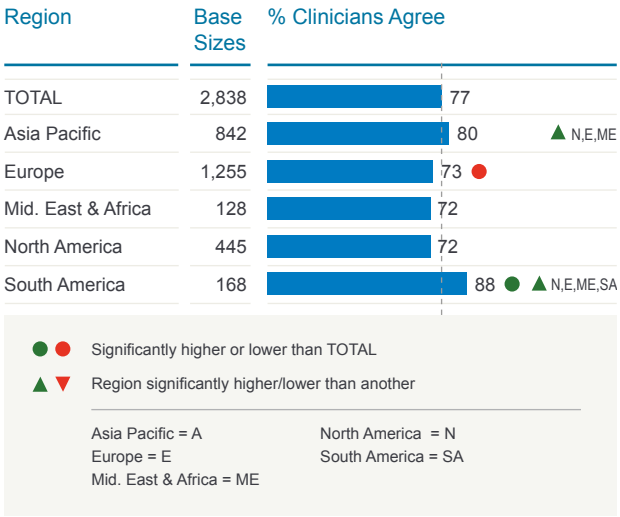


Fig 35: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Technology companies will be key stakeholders in managing healthcare systems.

Identifying outbreaks

With tech giants working together across the health space, pattern recognition in real-time becomes normalized. Today the CDC and WHO rely on reports from institutions of test results to track infectious diseases; recent studies identify the potential for change – tech companies are transforming the landscape.[20]

- A patient searches their symptoms online
- The search engine picks up trends in searches locally and cross-references with aggregated data on recent diagnoses, combine with mobility data and other possible predictors (e.g. high rainfall, temperature)
- A pattern emerges indicating a possible epidemic
- The search engine suggests next steps for the patient, points them to medicines to purchase online and offers to make a remote appointment with their clinician
- The search engine alerts the relevant health authority

The involvement of major tech companies in healthcare could accelerate digital developments, giving clinicians and patients access to tools that support analysis, diagnosis and treatment planning. As the companies are consumer-focused, these tools are likely to be focused on user (clinician or patient) experience and patient outcomes. Companies providing the technology to both patients and clinicians will be in a strong position to bring the two closer together and ensure their information is better integrated.

"Because patients will have their own data, they will be able to come to appointments with more information which will help us do our job and treat them."

Dr Omar Ibrik, Spain, who participated in the discovery interviews for the Clinician of the Future study.

Statement: The impact of health inequalities will be exacerbated by greater use of Digital Health Technologies

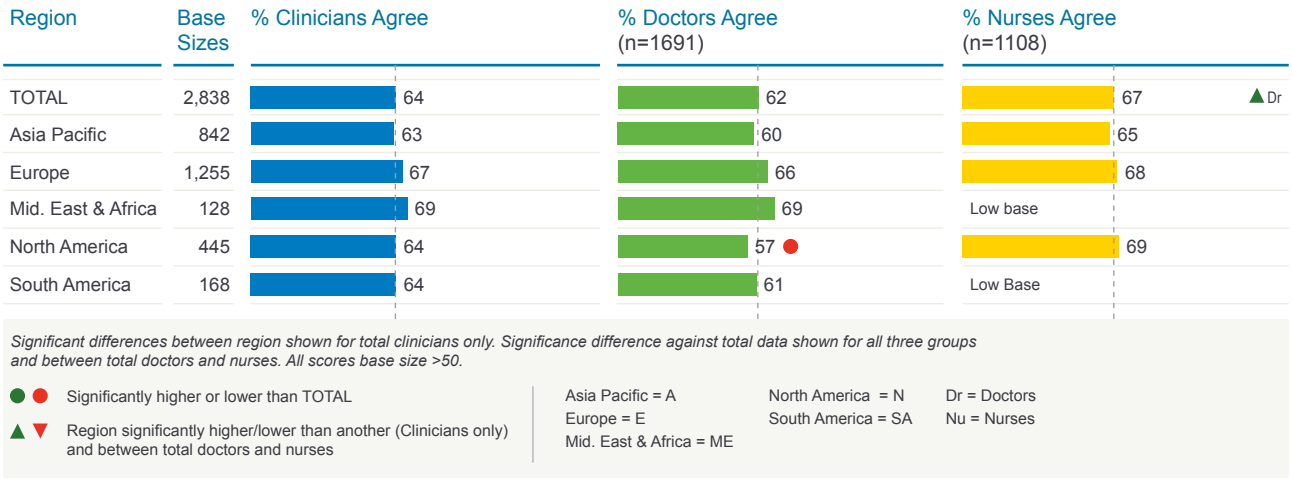


Fig 36: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: The impact of health inequalities will be exacerbated by greater use of Digital Health Technologies. For more information on base sizes for doctors and nurses see Appendix on page 115.

While this will be positive for many patients, it could also widen the access gap. In the US roundtable held for the Clinician of the Future study, key opinion leaders noted that some groups will not have access to patient health technologies, distancing those patients from the benefits. Some might also lack internet access, making digital health inaccessible more generally. This concern was echoed around the world: in the survey, 64% of clinicians agreed the impact of health inequalities will be exacerbated by greater use of digital health technologies and more nurses (67%) than doctors (62%) agreed there would be inequalities.

> *"I was surprised to learn that clinicians are looking into rewarding patients that are proactive with their health with reduced healthcare costs; although it has great potential, examples like monitoring patients with wearables will play into creating larger disparities between patients that are at a financial/economic disadvantage. This will inevitably lead to healthcare being more affordable for the financially privileged."*
>
> *Samah Ahmed, Canada, who participated in the Clinician of the Future student roundtable.*

Other concerns expressed in the roundtable discussions for the Clinician of the Future study included a lack of regulation and the risk of misinformation. Health literacy and access to technology may not be aligned, which means people with access to digital health technology may not be able to determine what is credible, trustworthy information. Without regulation, misinformation in health apps could be a serious issue in the future. For example, a systematic review of asthma apps for patients found variable reliability, concluding that "clinicians cannot recommend tools that are inaccurate, unsafe or lack an evidence base."[21]

Data: big, small, connected

Tech giants in healthcare are supporting the rise of Big Data and are best placed to effectively integrate it into health systems. In the Clinician of the Future survey, 80% of clinicians agreed Big Data will be integral to managing population health. Substantially more clinicians agreed in APAC (86%) than in Europe (71%), with the highest agreement in China (95%). More doctors (84%) than nurses (76%) agreed.

Statement: Big data will be integral to managing population health

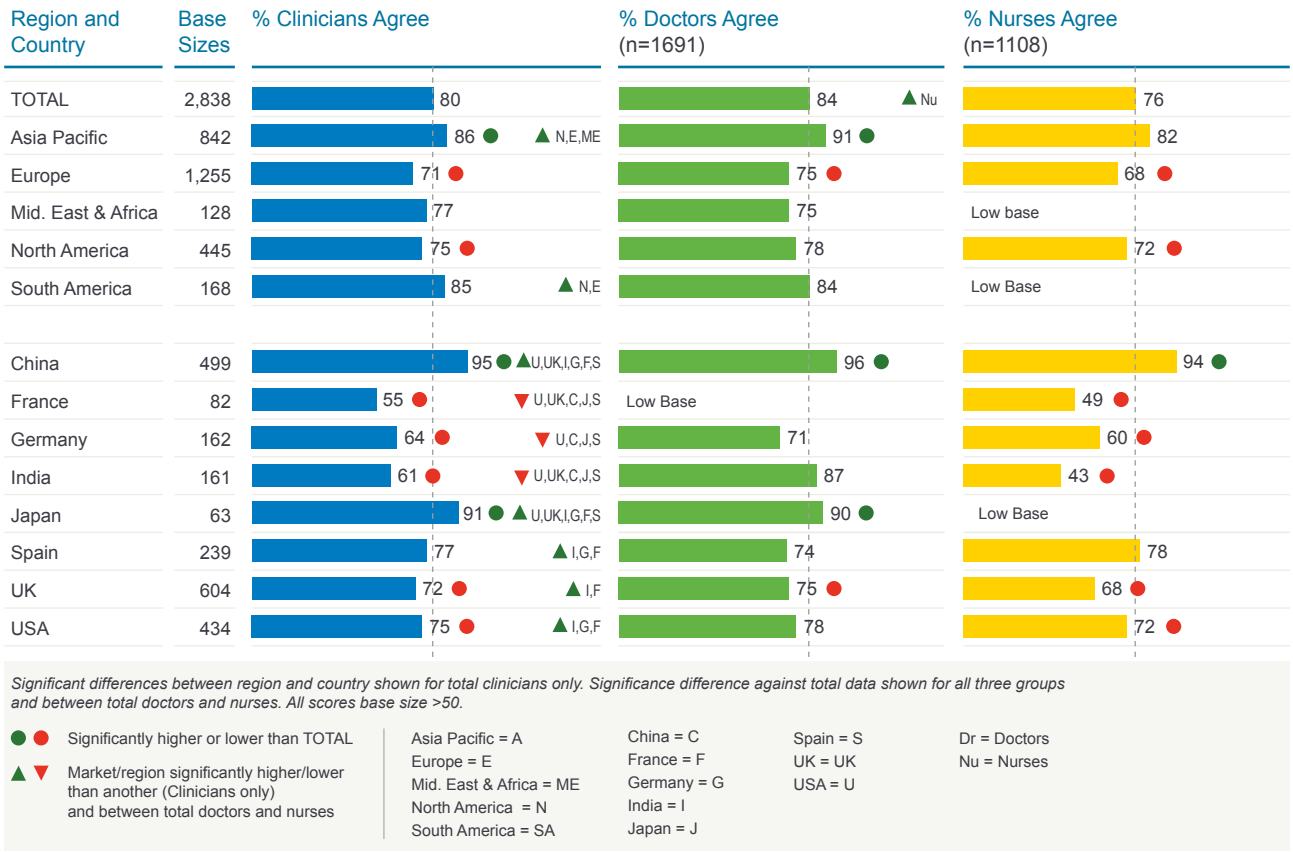


Fig 37: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % of respondents that agree with statement: Big data will be integral to managing population health. For more information on base sizes for doctors and nurses see Appendix on page 115.

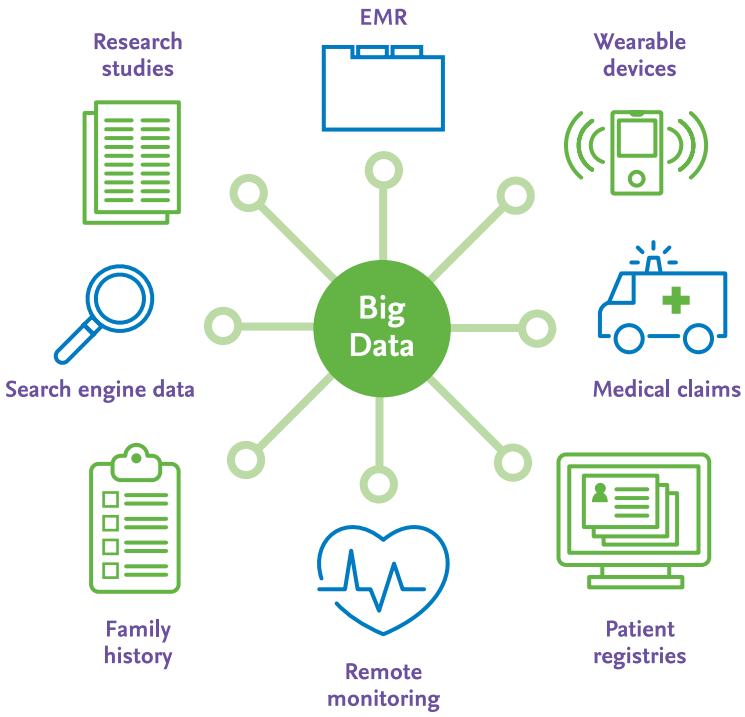
Genomic, environmental and population-level data are highly valuable for differential diagnoses. While these data are available to clinicians today, they are largely unusable, and many clinicians find them overwhelming. In the future, these data would be incorporated into clinical decision support systems, making them more valuable for clinicians.

With clinical decision systems that are interoperable and connected, both across institutions and countries and with patient apps, small data could also be pooled. Data from patients' health apps, such as the number of hours they sleep, the number of steps they walk and their heart rate, can be aggregated and give a bigger data picture of a population. Results of clinical trials and scientific studies could also be incorporated. Similarly, patient data in clinicians' tools could be anonymized and aggregated to provide new insights.

Where are data coming from?

The Clinician of the Future will have access to multiple data sources, potentially brought together in the EMR.

- Data from hardware/Internet of Things – wearables like smartwatches, implanted medical devices, biometric devices like heart rate monitors, pedometers
- Data from software – smartphone apps for patients to track nutrition, mental health, menstrual cycle
- Data from Big Data lakes – the Amazon Web Services (AWS) Health Lake



Expanded teams with new data-centered roles

Given the greater importance of data in clinical decision making in the future, clinicians agree they will need to be data experts. In the Clinician of the Future survey, respondents ranked data analytics as the third most valuable capability in 2031, next to technology literacy (ranked first) and clinical knowledge (ranked second).

% Selecting	Now	Future
Clinical knowledge	71%	46%
Communication skills	50%	34%
Teamwork	38%	26%
Empathy	29%	18%
Critical thinking	28%	25%
Time management	19%	20%
Technology literacy	14%	50%
Initiative	10%	6%
Data analysis / Statistical knowledge	10%	37%
Flexibility	9%	11%
Enthusiasm	7%	5%
Curiosity	5%	5%
Financial literacy	3%	7%
Negotiation	3%	4%
Ambition	3%	4%
Don't know	<1%	1%
None of the above	<1%	<1%

Now: Three most valuable capabilities in 2021

% Selecting	Top most valuable	Second most valuable	Third most valuable
Total	Clinical knowledge 71%	Communication skills 50%	Teamwork 38%
APAC	Clinical knowledge 73%	Communication skills 52%	Teamwork 41%

Future: Three most valuable capabilities in 2031

% Selecting	Top most valuable	Second most valuable	Third most valuable
Total	Technology literacy 50%	Clinical knowledge 45%	Data analytics / Statistical knowledge 38%

Based on global data

Fig 38: Question: Please think about the following capabilities that you think are most valuable for clinicians, like yourself, to fulfil their role. From the list below, please select the three that are most valuable today in 2021. And the three that will be most valuable in 10 years' time in 2031.

Although tech skills are expected to be more critical in the future, soft skills, such as communication and empathy, will remain important rather than being replaced. With today's team structure, this could be too much of a burden for clinicians – they are already stretched and finding it challenging to maintain clinical knowledge and learn new skills (see Chapter 4: The Future Balanced Clinician on page 73).

Instead, the clinical team is predicted to look different in the future – some roles could be replaced by technology and new roles will appear.

"There will be more data analysts in the team. They will work within the background and alert the GP when patients may need extra care."

Dr Michael Lempel, USA, who participated in the discovery interviews for the Clinician of the Future study.

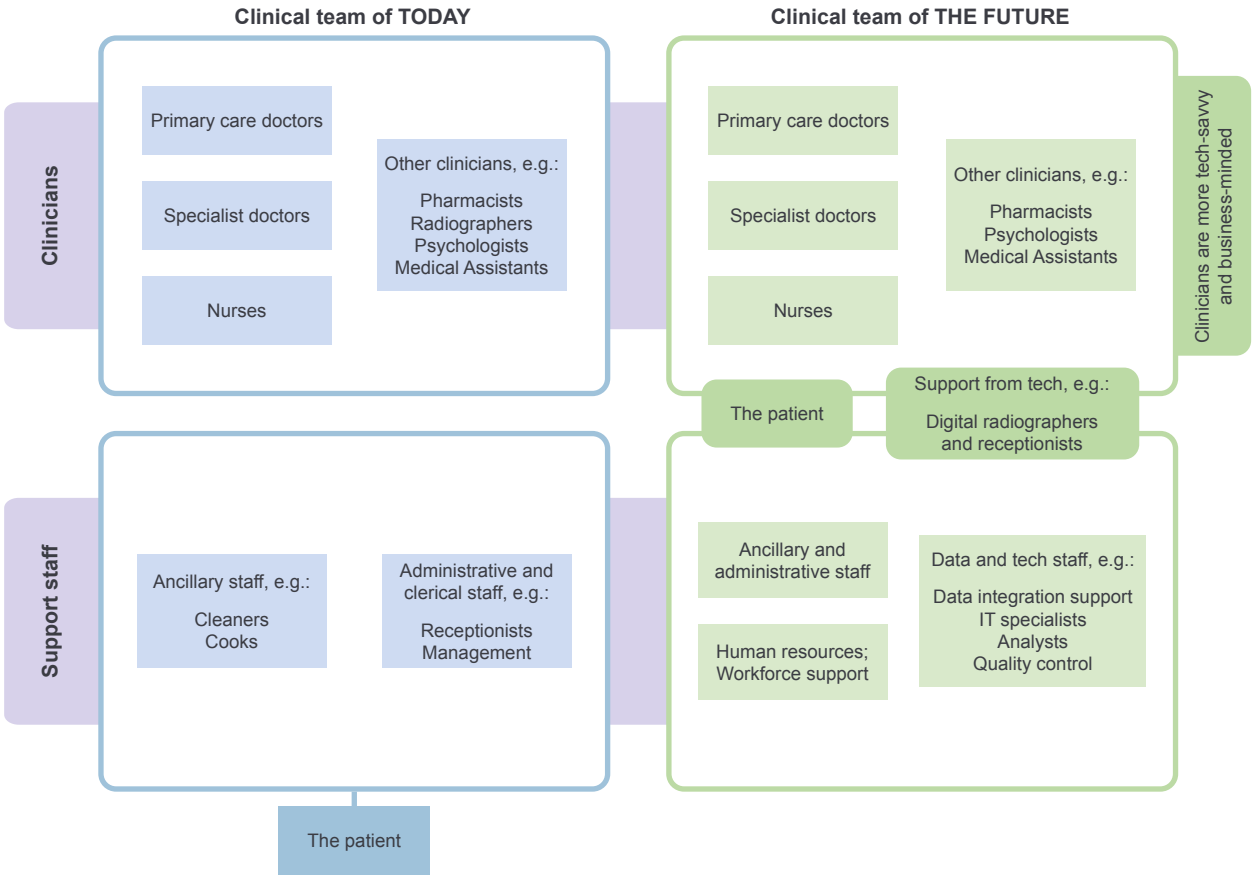
Technology could take on many tasks for administrators, receptionists and medical assistants. With technology ranging from automated booking systems to chatbots for triage, patients could take more control of this aspect of healthcare work.

With the expected integration of AI into clinical systems, some roles in radiography could also be supported or even replaced by technology. AI is already capable of sophisticated image analysis today; in 10 years this is likely to have progressed significantly.[22]

Clinicians expect the clinical team to expand, bringing in data experts. Data analysts, IT specialists and digital quality control roles could take responsibility for the deeper data analysis, ensuring clinicians receive usable information to support their decision making.

"There is an expansion of nursing roles in the community but nursing roles in the hospital have become more focused on collecting data, submitting data and less focused on clinical observations and patient care."

Clinician, Australia, who responded to the Clinician of the Future survey.



How do we get there?

Many clinicians believe that, with the right education and support, digital health will make their roles easier and reduce their overall work burden. But the future promise of digital health technology and data depends on the technology itself – and the clinicians who will be using it.

> *"In terms of digital processes, I think there's something about being an active participant in this rather than feeling like it's happening to us... Teaching the application of technology to enable future clinicians to be effective and safe needs to start right at the beginning of training."*
>
> *Prof Gemma Stacey, UK, who attended the Clinician of the Future UK roundtable.*

On the technology side, there are security and credibility needs – the tools and systems need to be reliable, trustworthy and safe. On the user side, clinicians need the time, headspace and opportunity to learn the skills and knowledge needed to use technology and data to the fullest.

Training that keeps pace

The pace of technological advancement is accelerating, but medical education is not keeping up. In the Clinician of the Future survey, clinicians identified training in the effective use of digital health technologies to assist in the delivery of patient care remotely as a key priority for the future. Healthcare training and education to stay up-to-date ranked as the number one priority, and clinicians agree education needs to be delivered not only at the start of training but throughout their career.

Healthcare leaders discussed data and technology in medical education at the Reach Faculty "future of health" roundtable. They acknowledged there is a need for doctors to have some understanding of the principles of biostatistics, but they noted the absence of training in interpreting and using technology.

To keep up with the fast pace of technological change, clinical education could also require major changes. In the Clinician of the Future survey, 83% of clinicians agreed their training needs to be overhauled to keep pace with the introduction of new technologies.

Statement: The training of clinicians needs to be overhauled to keep pace with the introduction of new technologies

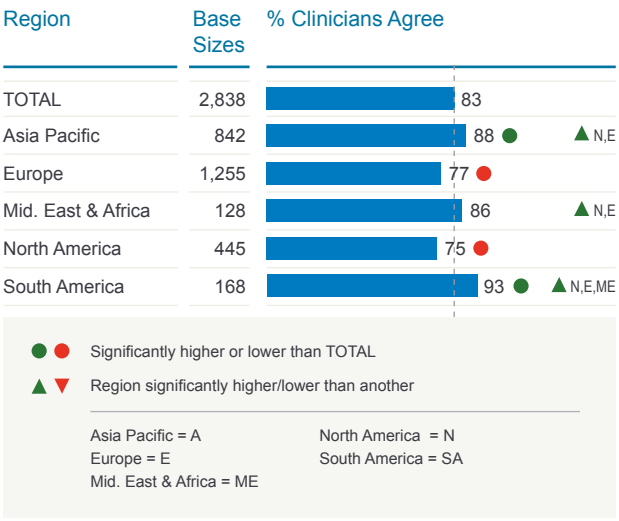


Fig 39: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Shows % of respondents that agree with statement: The training of clinicians needs to be overhauled to keep pace with the introduction of new technologies.

Although clinicians expect the care team to expand with new data-focused roles in the future, there will still be a need for clinicians to understand and use data and technology. In the UK roundtable held for the Clinician of the Future study, key opinion leaders discussed the importance of education. They suggested that if clinicians have to rely solely on data experts, they might be less likely to adopt new approaches fully themselves and use them effectively. If clinicians have the opportunity to learn how to use data and technology confidently, they can foster self-belief in their abilities and therefore motivation to use new approaches.

Similarly, key opinion leaders at the China roundtable suggested a more comprehensive education system for medical students that incorporates education on precision medicine and intelligent healthcare would be beneficial and produce a "more versatile doctor." They noted that if a doctor is unable to interpret genetic results or understand how AI can be leveraged, they might be less effective in their role.

Skills clinicians identified for education in the digital era

- Digital communication technology; telehealth platforms
- Empathy in the digital environment
- Interpreting data using AI
- Talking to patients about their consumer health data
- Making clinical decisions using technology
- Understanding genomic data

Time will likely be a major factor in the effectiveness of incorporating data and technology into clinical education. Key opinion leaders at the UK roundtable discussed the issue of clinicians needing headspace to learn digital health skills and feel competent and confident to use them. Learning and adopting new technologies takes time, and with the current pressures on clinicians, this might need to be provided systematically to avoid burnout (see Chapter 4: The Future Balanced Clinician on page 73).

"There's little to no time spent separately to learn how technology can complement and enhance the practice and delivery of healthcare. That education needs to be instilled into the system to ensure all physicians are comfortable and able to use all modes accessible to treat patients when they come out of training."

Dr Hemalee Patel, USA, who participated in the Reach Faculty "future of health" roundtable.

Human-centered design

As shared in the Clinician of the Future study, one of the frustrations many clinicians have with today's EMR is that they believe it is not fit-for-purpose. Originally developed as a billing tool, the EMR has evolved. Rather than being a tool designed to meet care needs, it provides unnecessary bureaucracy. However, if re-designed with the clinician and patient at the heart, it has the potential to relieve administrative burden.

"We need a universal single electronic health record system. Different hospitals have different EHR and patient information is never shared. Doctors waste too much time in typing entering same data repeatedly again and again and again."

Clinician, USA, who responded to the Clinician of the Future survey.

When based on this kind of human-centered design, the EMR and other tools could be more useful. The focus is often on automating existing individual tasks, but simply digitalizing a task that is part of a problematic process or system is unlikely to be effective.

"Too much to do, not enough time with patients. Tech was supposed to be our saviour but has made things worse – poor systems (I often have to have 5 open at the same time in clinic). No one listens when we tell them – no one truly involves us in design. In fact the strategy for our latest digital "innovation" was to deliver the digital strategy – nothing about patients or service users."

Doctor, UK, who responded to the Clinician of the Future survey.

New approaches to data management

Safety, security and quality will be key to ensuring clinicians can use data and technology effectively. With more patient data available, data privacy will likely be even more of a sensitive issue in the future. People's perceptions and expectations of data privacy could also affect their willingness to adopt technology.[23]

Safety measures, including regulations, around data sharing and privacy will likely need to evolve as the use of data increases.[24] Currently there is a gap when it comes to the regulation of digital health software. Medical devices – hardware – are extensively regulated, but regulations often do not yet cover consumer software, such as smartphone apps. To close the gap, the International Medical Device Regulators Forum (IMDRF)[25] has set out guidelines for "Software as a Medical Device (SaMD)."[26]

Consumer wearables, like smartwatches, provide a potential entry point for hackers looking to acquire patient information. As their use increases, the risk of data breaches may also increase.[27] If the data is being shared with clinicians through digital healthcare systems, this presents a data privacy risk.

"British Medical Association or American Medical Association will need to lead in showcasing how to use technology and the safety (digital safety) around using electronics in healthcare. Security of using these tools is a big issue and so these organizations need to show that they are safe."

Dr Mukul Roy, India, who participated in the discovery interviews for the Clinician of the Future study.

In the Reach Faculty "future of health" roundtable, key opinion leaders discussed the need for quality control and governance. They believe strong data and system governance will be needed as technology is rolled out in hospitals. They suggested that law, data quality, and compliance will be key pillars when introducing a new technology into a practice, and they acknowledged the amount of work that will be needed to ensure the technology is safe before clinicians can use it.

Today's challenges	Action	Tomorrow's opportunities
➤ Data overwhelm	➤ Systems that incorporate AI and data analysts on the clinical team	➤ A range of data types used for better patient outcomes
➤ Frustrations with inefficient systems and EMR	➤ Efficient, integrated systems and time to learn them	➤ Less administrative burden, more time for patients and learning
➤ Concerns about empathy	➤ Training that includes soft skills in digital environment	➤ Clinician–patient relationship maintained in 2D

Chapter 3: References

1 Statista. Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2025. June 2021. https://www.statista.com/statistics/871513/worldwide-data-created/

2 Arshad A. S. et al. Global Interest in Telehealth During COVID-19 Pandemic: An Analysis of Google Trends™. Cureus. 16 September 2020. 12(9): e10487. https://doi.org/10.7759/cureus.10487

3 Evans, R. S. Electronic Health Records: Then, Now, and in the Future. Yearb Med Inform. 20 May 2016. Suppl 1(Suppl 1):S48-61. https://doi.org/10.15265/IYS-2016-s006

4 Ehrenstein, V. et al. Obtaining Data From Electronic Health Records. In: Gliklich R. E. et al. Tools and Technologies for Registry Interoperability, Registries for Evaluating Patient Outcomes: A User's Guide, 3rd Edition, Addendum 2 [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US). October 2019. Chapter 4. https://www.ncbi.nlm.nih.gov/books/NBK551878/

5 FDA. Recently-Approved Devices. 24 June 2021. https://www.fda.gov/medical-devices/device-approvals-denials-and-clearances/recently-approved-devices

6 Statista. Number of mHealth apps available in the Apple App Store from 1st quarter 2015 to 1st quarter 2021. May 2021. https://www.statista.com/statistics/779910/health-apps-available-ios-worldwide/

7 Statista. Number of mHealth apps available in the Google Play Store from 1st quarter 2015 to 1st quarter 2021. May 2021. https://www.statista.com/statistics/779919/health-apps-available-google-play-worldwide/

8 HealthIT.gov. What are the differences between electronic medical records, electronic health records, and personal health records? 2 May 2019. https://www.healthit.gov/faq/what-are-differences-between-electronic-medical-records-electronic-health-records-and-personal

9 Patel S. Y. et al. Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US. JAMA Intern Med. 2021. 181(3):388–391. https://doi.org/10.1001/jamainternmed.2020.5928

10 Statista. Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2025. June 2021. https://www.statista.com/statistics/871513/worldwide-data-created/

11 Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). COVID-19 Dashboard. https://coronavirus.jhu.edu/map.html

12 Jia Q. et al. Big Data Analytics in the Fight against Major Public Health Incidents (Including COVID-19): A Conceptual Framework. International Journal of Environmental Research and Public Health. 2020. 17(17):6161. https://doi.org/10.3390/ijerph17176161

13 Gabarron, E. et al. COVID-19-related misinformation on social media: a systematic review. Bull World Health Organ. 1 June 2021. 99(6):455-463A. https://doi.org/10.2471/BLT.20.276782

14 Wosik, J. et al. Telehealth transformation: COVID-19 and the rise of virtual care. Journal of the American Medical Informatics Association. June 2020. Volume 27, Issue 6, 957–962. https://doi.org/10.1093/jamia/ocaa067

15 Koch, s. Home telehealth—Current state and future trends. International Journal of Medical Informatics. 2006. Volume 75, Issue 8, 565-576. https://doi.org/10.1016/j.ijmedinf.2005.09.002

16 Arif, R. In The Post COVID-19 World, Zoom Is Here To Stay. Forbes. 26 February 2021. https://www.forbes.com/sites/raufarif/2021/02/26/in-the-post-covid-19-world-zoom-is-here-to-stay/

17 Turea, M. How the "Big 4" Tech Companies Are Leading Healthcare Innovation. Healthcare Weekly. 27 February 2019. https://healthcareweekly.com/how-the-big-4-tech-companies-are-leading-healthcare-innovation/

18 Diana, M and Marescaux, J. Robotic surgery. British Journal of Surgery. January 2015. Volume 102, Issue 2, e15–e28. https://doi.org/10.1002/bjs.9711

19 Turea, M. How the "Big 4" Tech Companies Are Leading Healthcare Innovation. Healthcare Weekly. 27 February 2019. https://healthcareweekly.com/how-the-big-4-tech-companies-are-leading-healthcare-innovation/

20 Kishore K. et al. Exploring the Utility of Google Mobility Data During the COVID-19 Pandemic in India: Digital Epidemiological Analysis. JMIR Public Health Surveill. 2021. 7(8):e29957. https://doi.org/10.2196/29957

21 Huckvale, K. et al. Apps for asthma self-management: a systematic assessment of content and tools. BMC Med.2012. 10, 144. https://doi.org/10.1186/1741-7015-10-144

22 Johnson, K. B. et al. Precision Medicine, AI, and the Future of Personalized Health Care. Clin Transl Sci. 2021. 14: 86-93. https://doi.org/10.1111/cts.12884

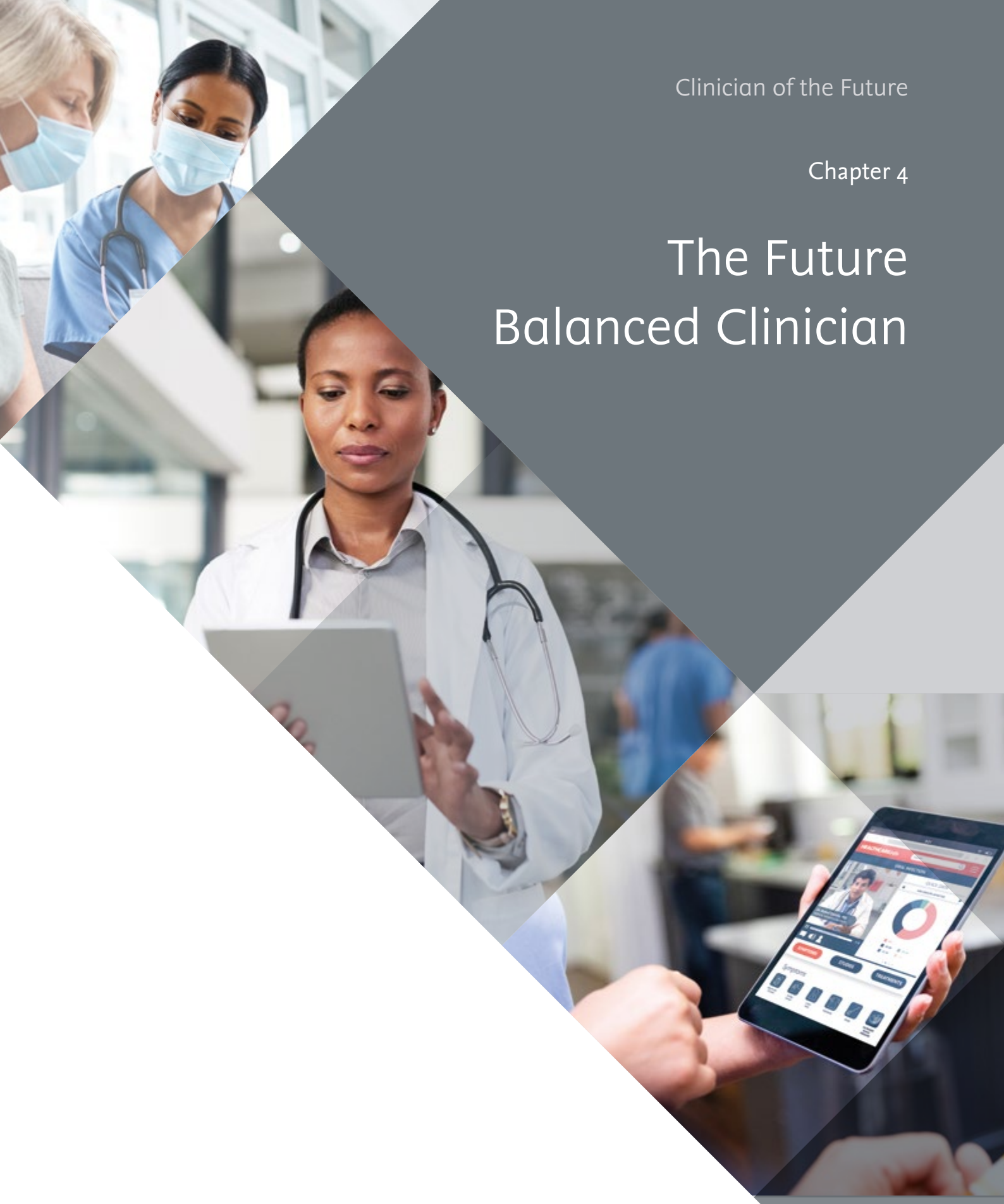
23 Emami-Naeini, P. et al. Which Privacy and Security Attributes Most Impact Consumers' Risk Perception and Willingness to Purchase IoT Devices? IEEE Symposium on Security and Privacy (SP). 2021. 519-536. https://doi.org/10.1109/SP40001.2021.00112

24 Abouelmehdi, K. et al. Big healthcare data: preserving security and privacy. J Big Data. 2018. 5, 1. https://doi.org/10.1186/s40537-017-0110-7

25 FDA. International Medical Device Regulators Forum (IMDRF). 27 August 2019. https://www.fda.gov/medical-devices/cdrh-international-programs/international-medical-device-regulators-forum-imdrf

26 FDA. Software as a Medical Device (SaMD). 4 December 2018. https://www.fda.gov/medical-devices/digital-health-center-excellence/software-medical-device-samd

27 Prasant, P. et al. Role of internet of things in protecting different wearable gadgets and materials. Materials Today: Proceedings. 2021. https://doi.org/10.1016/j.matpr.2021.10.332



Clinician of the Future

Chapter 4

The Future Balanced Clinician

ELSEVIER

Health

Tackling workforce shortages and burnout

Meet the future balanced clinician.

With global clinician shortages putting pressure on their time, the clinician of the future has a challenging workload. They love their job and their role is dynamic and engaging. When work pressure affects their mental wellbeing, they can lean on support systems – including digital technologies – provided by their employer, and they are part of peer support groups. They face a constant flow of new technologies and information to learn, and they are given the time to do this, to benefit patient care.

Today	Drivers of change	The future	Action
Burnout: 26% of clinicians surveyed agreed wellbeing support is a priority. **Imbalance:** Full-time employed clinicians surveyed work 49 hours on average; 57% agreed they have a good work–life balance. **Depleting joy:** Many roles are changing for the worse: 71% of doctors in the USA and 66% in the UK agreed their roles have become worse in the last 10 years.	**Changing roles:** 63% of clinicians agreed the role of the doctor has changed considerably and 66% for the nurse's role. **Digital tech:** 69% of clinicians agreed that the volume of patient data is already overwhelming. **COVID-19:** 97% of clinicians agreed the pandemic is a key driver for change.	**Shortages:** Clinicians believe there will be a shortage of nurses (74% agreed globally) and doctors (68%). **Different roles:** 41% of clinicians expect to be seen as less valuable to patients. **Digital burden:** 69% of clinicians agreed digital health technologies will be a challenging burden.	➤ Focus on clinician wellbeing ➤ Ensure a complete workforce ➤ Recruit through optimized training

Unless otherwise stated, the figures in this summary table are key findings from the Clinician of the Future survey, conducted with n=2838 clinicians.

Today's clinicians are burning out

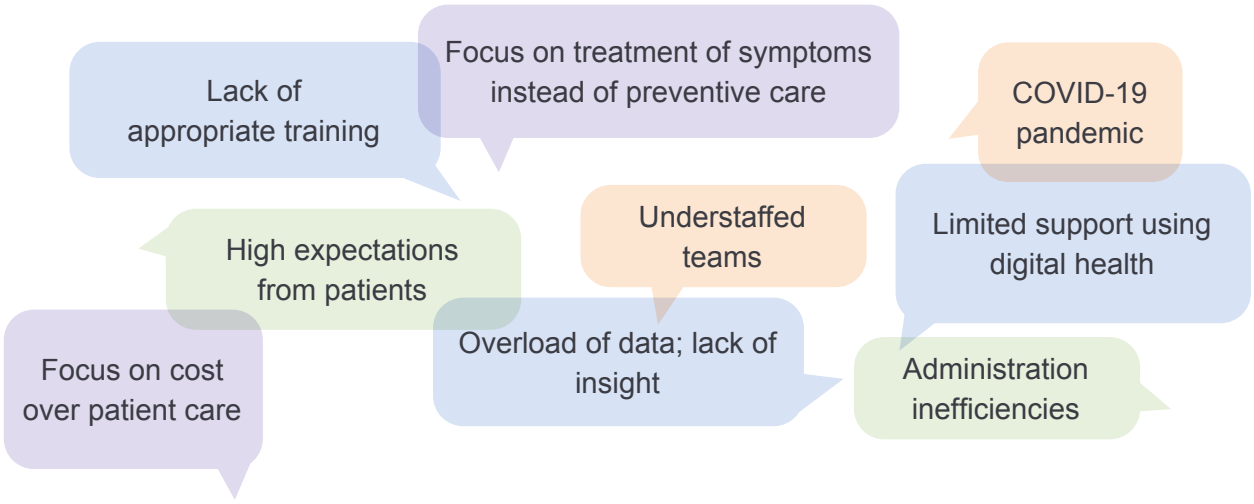
Today's clinicians are clinically knowledgeable and skilled, empathetic and driven to help people, but they are feeling overstretched. Critical shortages of doctors, nurses and midwives globally are placing a burden on resources, leaving clinicians to deal with hectic schedules, high expectations and inconsistent support. The clinicians who participated in the Clinician of the Future study shared that they feel overloaded with data and stuck with burdensome, inefficient administrative systems. And the added pressures of the COVID-19 pandemic are exacerbating an already difficult situation.

On top of this, clinicians report that they are feeling undervalued and unsatisfied with the current healthcare system. While they welcome change, they are struggling to keep up to date with the latest developments and the new skills they need to be equipped for the future – particularly around the rise of digital health.

"I just think the piling up of demands on those individuals is running the risk of burning them out for sure."

Dr Ian Tong, USA, who participated in the discovery interviews for the Clinician of the Future study.

In a survey of 12,000 doctors in the USA carried out by Medscape in late 2020, 42% reported they were burned out.[2] This was more common among women (51%) than men (36%). Most doctors attributed their burnout to 'too many bureaucratic tasks' (58%). Despite the added pressure of the COVID-19 pandemic, 79% of doctors reported their burnout started before the virus appeared. Indeed, Medscape's 2016 survey had similar results, suggesting this is a longer-term problem.[3]



Key themes that emerged as challenges during discovery interviews for the Clinician of the Future study.

Exhaustion and overload

These interconnected challenges are contributing to high burnout rates. Burnout is a major challenge for healthcare professionals. A 2021 report by Morning Consult showed that 18% of USA healthcare workers had resigned during the COVID-19 pandemic, and an additional 12% were laid off. Of those who were still working at the time of the survey, 31% said they had considered leaving their jobs.[1]

Although clinicians' workloads and pressures can vary depending on the context, burnout appears to be a global phenomenon. While some of the contributing factors are common (workforce shortages and subsequent overload are global, as is the pressure from the COVID-19 pandemic), others are more specific.

The length of working hours is not the only factor in increasing burnout and decreasing mental health, but it is one of the causes: in the Clinician of the Future survey, the average working week among full-time employed clinicians was 50 hours. Most clinicians (56%) reported working 46 hours or more per week; among doctors this was a higher proportion (65%). Doctors averaged 58 hours per week.

Globally, 29% of clinicians surveyed agreed that they work more now than they did five years ago, and 12% reported working a lot more than they did five years ago. The picture differs globally. Significantly more clinicians reported working more hours now than five years ago in Europe, North America and the MEA region. Notably, a higher proportion of respondents reported an increase in working hours in Germany (49%), the UK (44%) and Japan (48%). Fewer clinicians in China (12%) noted an increase in hours.

Percentage of clinicians who work more now than 5 years ago

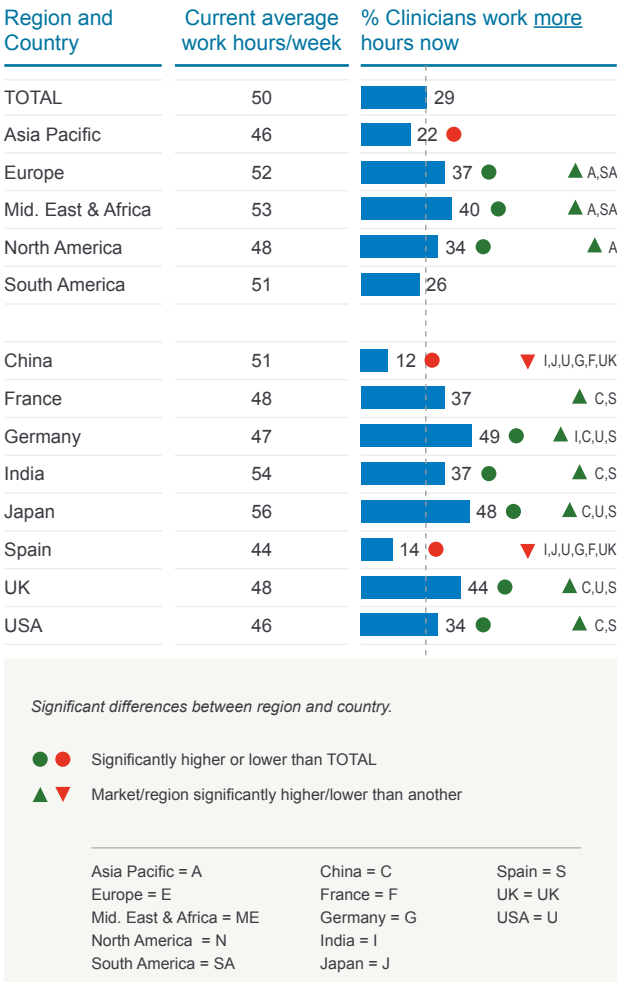


Fig 40: Question: Approximately, how many hours do you work as a clinician in a typical week? Shows average hrs worked for full-time clinicians (who work 36hrs plus).

Question: "How do the hours you work as a clinician in a typical week now compare to 5 years ago? Shows % clinicians who work more now than 5 years ago. For more information, see the Methodology section on page 109.

"The new stressors of having on average sicker patients, higher student debt, lower relative wages (in residency), and higher costs of living, especially in very wealthy parts of the country, make it harder to support a family and make medicine an overall harder career to enjoy. Simultaneously, physician autonomy and inclusion in hospital administrative decisions are seemingly going away."

Clinician, USA, who responded to the Clinician of the Future survey.

Salary stress

Salary varies significantly around the world and is one of the main reasons given for migration among healthcare workers.[4] The current research did not investigate salary directly, but several clinicians commented on the additional stress of low pay.

"Because the working conditions as well as the salary are very low, which forces the professional to have many jobs at the same time in order to survive."

Clinician, Argentina, who responded to the Clinician of the Future survey.

"The poor working conditions, the work overload and the very bad pay, added to the little recognition of health in this period of pandemic, everything has led to very strong work stress and overload."

Clinician, Argentina, who responded to the Clinician of the Future survey.

The pressure of 'pajama time'

Although 85% of respondents to the Clinician of the Future survey agreed that they enjoy their jobs, only 57% agreed they have a good work–life balance. Respondents in the APAC region were more likely to agree they have a good work–life balance while those in Europe were less likely to agree. There are a couple of notable exceptions: in Germany, only 30% of clinicians agreed they have a good work–life balance, while in India, 79% of clinicians agreed.

The lack of balance is more pronounced among doctors: compared to nurses (65%), fewer doctors (49%) agreed that they have a good work–life balance in all markets. The biggest difference was in India, where 58% of doctors agree they have a good balance, compared to 93% of nurses.

"In real terms pay has decreased, more is expected of us, increasing workload and constant training (Even when qualified) to keep up to date and move forward. This has an impact on work/life balance and morale amongst some colleagues is low."

Nurse, UK, who responded to the Clinician of the Future survey.

Statement: I have a good work–life balance

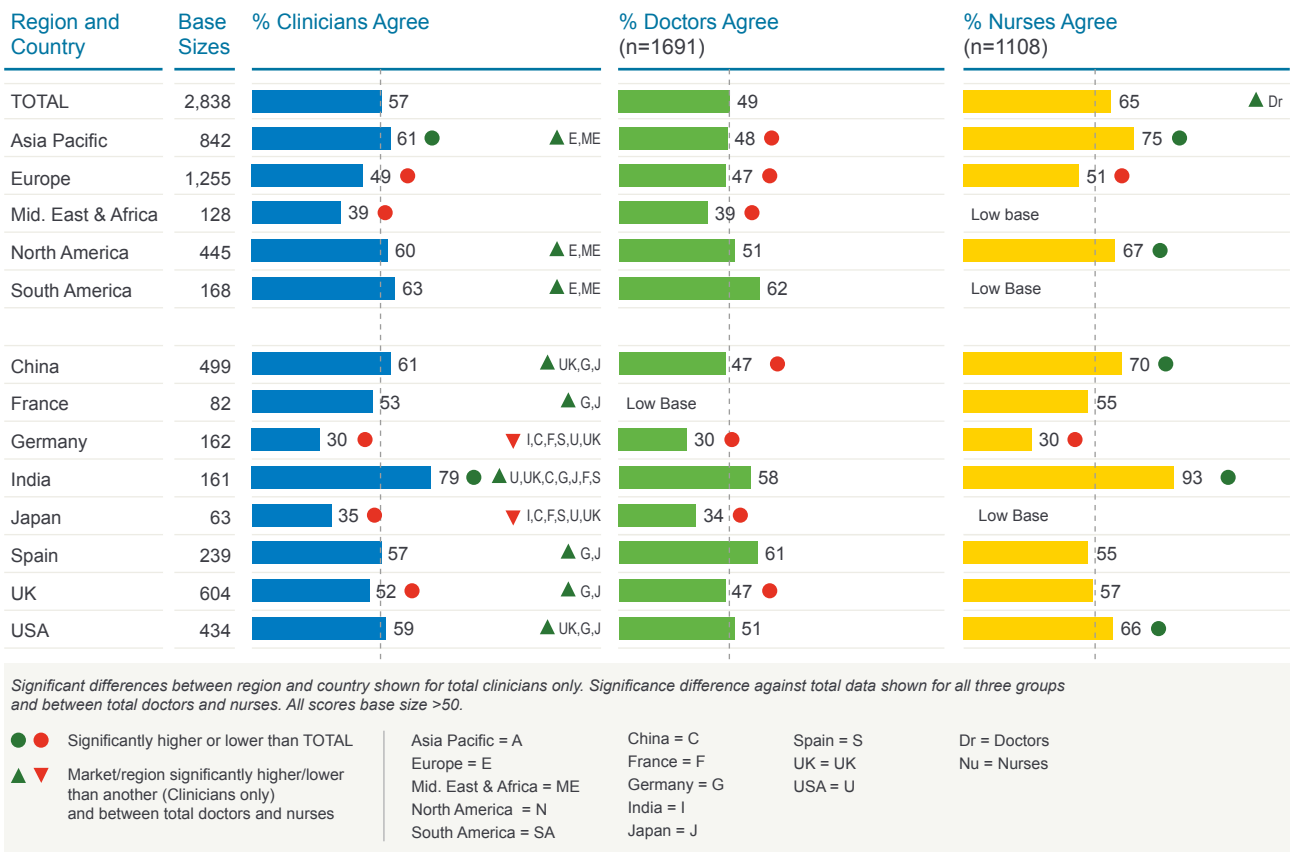


Fig 41: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? % agree with statement: I have a good work–life balance. For more information on base sizes for doctors and nurses see Appendix on page 115.

In addition to working hours, 'pajama time' may be contributing to this lack of balance, according to clinicians who participated in the Clinician of the Future study. After they have left the clinic and finished their patient appointments, there is still work for clinicians to do. In the office or at home, they finish their administrative tasks, like completing electronic health record (EHR) or electronic medical record (EMR) information and prior authorization requests.
This is also when they invest in continuous learning, which is an essential factor in their success. Doing this work in their own time – 'pajama time' – is a work–life balance drainer.

Planning their next move

In the Clinician of the Future survey, respondents shared whether they were planning to leave their current role within the next two to three years; almost one-third (31%) said they were. There was a reasonable amount of geographical variation: fewer clinicians in China (14%) were planning to leave, with much higher proportions in Germany (48%), the UK (47%) and the USA (47%) planning to leave.

Of the survey respondents who were considering a move, over half agreed they will stay in healthcare, either in a similar role but a different setting (33%) or a different job impacting patient care (20%). However, 39% expected they will leave the profession. Some will retire (21%), but there is a group of clinicians who are unsatisfied and plan to move to a non-healthcare related job (13%) or do something else (5%).

"Much more shadow work being done at home- - answering pt emails by EMR to all hours of the night. Not much support for the extra work being done on the EMR."

Clinician, USA, who responded to the Clinician of the Future survey.

Considering leaving role in next 2-3 years

Region and Country	Base Sizes	% Clinicians Agree	
TOTAL	2,838	31	
Asia Pacific	842	19 ●	
Europe	1,255	42 ●	▲ A,SA
Mid. East & Africa	128	42 ●	▲ A
North America	445	47 ●	▲ A,SA
South America	168	31	▲ A
China	499	14 ●	▼ F,S,U,G,UK,J
France	82	37	▲ C,I
Germany	162	48 ●	▲ C,I,J,S
India	161	19	
Japan	63	33	▲ C,I
Spain	239	33	▲ C,I
UK	604	47 ●	▲ C,I,J,S
USA	434	47 ●	▲ C,I,J,S

Significant differences between region and country.

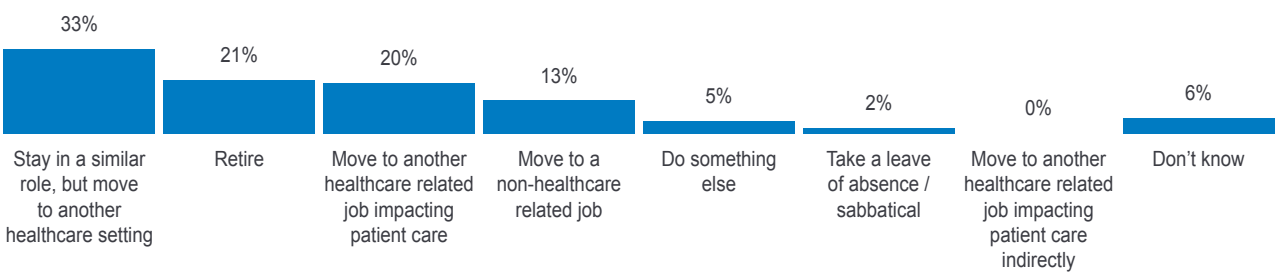
●● Significantly higher or lower than TOTAL

▲▼ Market/region significantly higher/lower than another

Asia Pacific = A
Europe = E
Mid. East & Africa = ME
North America = N
South America = SA
China = C
France = F
Germany = G
India = I
Japan = J
Spain = S
UK = UK
USA = U

Fig 42: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? % agree with statement: I am considering leaving my current role within the next 2-3 years.

The 31% (Base=981) of survey respondents who expect to leave their role in the next 2-3 years plan to:



Unmet expectations and unfulfillment

Those leaving the profession may be doing so due to a general feeling of being undervalued and unappreciated, and the job not meeting expectations. In the Clinician of the Future survey, only 30% of clinicians globally reported feeling that government officials fully appreciate the critical importance of the work they do; this figure was lowest in Europe (14%), with low proportions in France (8%) Germany (10%) Spain (13%) and UK (18%).

Overall, nurses (35%) feel more appreciated than doctors (25%). Doctors in the USA (16%), the UK (16%), India (17%), Germany (19%) all felt unappreciated. There were some exceptions to the nurse/doctor dichotomy: in Germany, 6% of nurses feel appreciated by the government, compared to 19% of doctors.

Statement: I feel like the critical importance of the work I do as a clinician is fully appreciated by Government officials

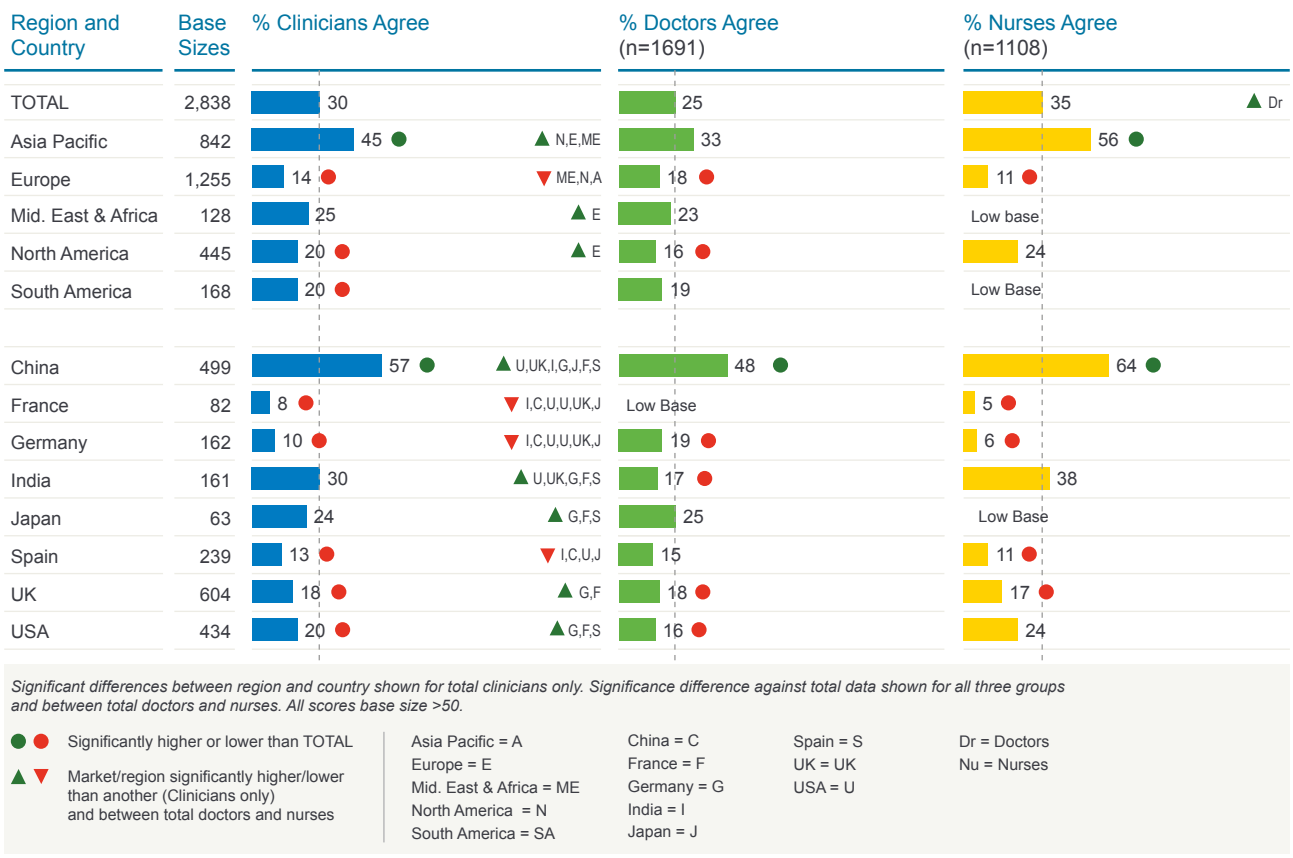


Fig 44: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? % agree with statement: I feel like the critical importance of the work I do as a clinician is fully appreciated by Government officials. For more information on base sizes for doctors and nurses see Appendix on page 115.

There is a similar picture when it comes to feeling appreciated by the public. Although the proportion is higher than for government appreciation, still only about half (55%) of the clinicians surveyed agreed the critical role they play is appreciated by the general public. Substantially more clinicians in the APAC region (64%) agreed they feel appreciated by the public.

Statement: I feel the critical importance of the work I do as a clinician is fully appreciated by the general public

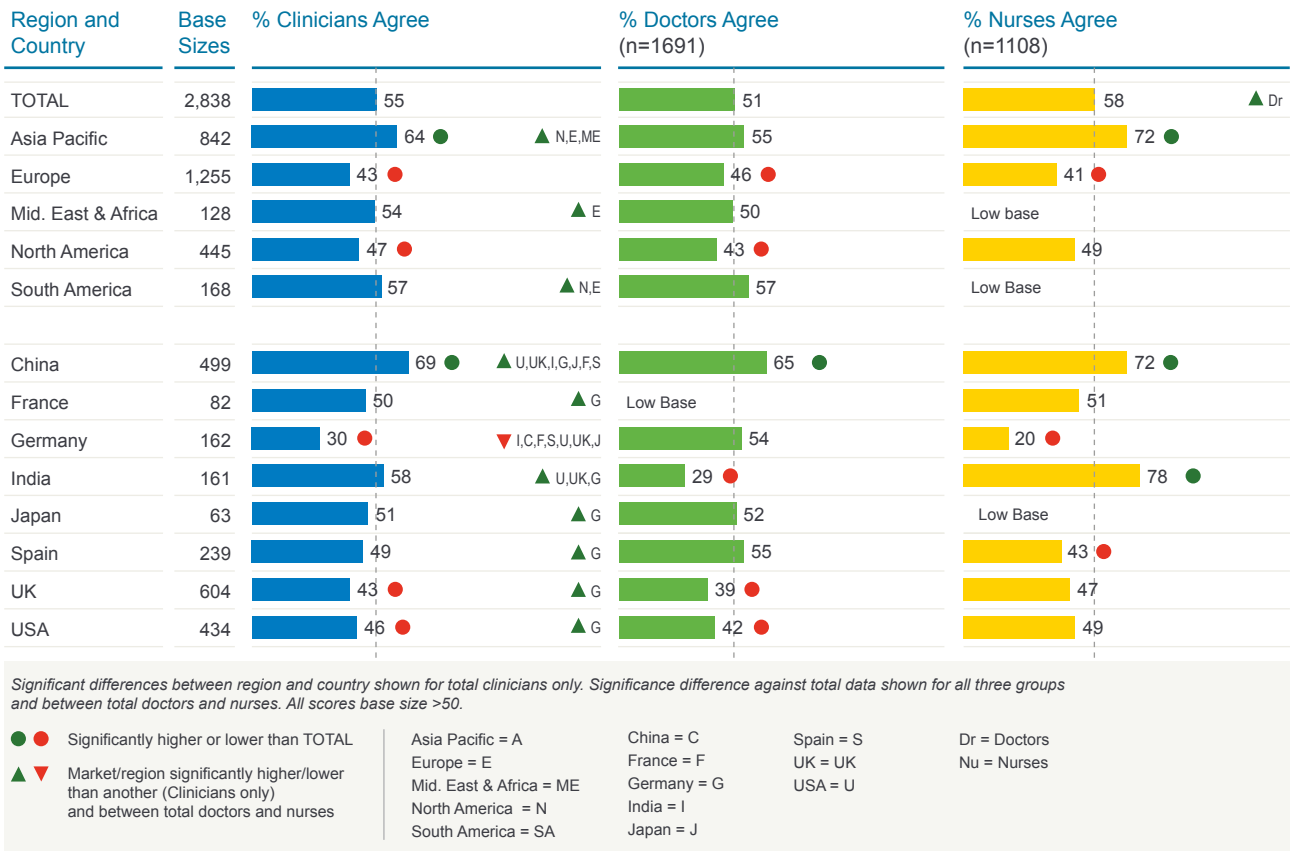


Fig 45: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare. % agree with statement: I feel the critical importance of the work I do as a clinician is fully appreciated by the general public. For more information on base sizes for doctors and nurses see Appendix on page 115.

Clinicians in Germany are feeling particularly underappreciated, both by the government (only 10% agreed the importance of their work is appreciated) and by the general public (30%).

"Especially in the current pandemic situation, I have the feeling that I am being treated much worse from all sides (be it from superiors, employees, patients and above all relatives). Due to the emergency (at least in the hospital) you are no longer the highly respected doctor, but just the idiot who takes on most of the tasks, bears the greatest responsibility and is still met with mainly anger, frustration, disrespect, resentment, etc."

Clinician in Germany, who responded to the Clinician of the Future survey.

The clinician–patient relationship is also a factor in the decision to leave a job, according to a systematic review carried out in the UK.[5] The research showed that UK primary care doctors "report a reduction in job satisfaction" linked to changing relationships with patients, loss of autonomy and interfaces with secondary care. With depleted job satisfaction, increased patient demand and a heavier workload, doctors are prone to burnout and can end up deciding to leave general practice.

What's driving change?

There are many interrelated factors affecting clinician burnout and dissatisfaction. By understanding what is driving change, we can better support a more positive future.

Clinician shortages

Clinician shortages are already impacting healthcare globally. The World Health Organization (WHO) estimates the world will need an additional 18 million health workers to achieve universal healthcare in low and middle income countries by 2030 and 9 million more nurses and midwives to meet the global targets of Sustainable Development Goal (SDG) 3: Good Health and Well-Being.[6][7]

Shortages also affect regions differently. According to the United Nations, data from 2013-2019 show there were 150 nurses and midwives per 10,000 people in Northern America, and only 10 per 10,000 people in sub-Saharan Africa.[8] Similarly, there were 25 doctors per 10,000 people in Northern America, Oceania and Central Asia and just two per 10,000 people in sub-Saharan Africa.

In the UK, research by the Health Foundation showed that the NHS in England will need an additional 1.1 million staff by 2031. As of October 2021, the NHS in England already had 94,000 vacancies.[9]

COVID-19 has worsened an already challenging situation by further depleting the workforce. In the first six months alone, an estimated 7,000 healthcare workers globally died as a result of the pandemic.[10]

Clinicians' roles are changing

As we have seen throughout this report, clinicians' roles are changing. According to clinicians who participated in the Clinician of the Future study, patient empowerment and the shift to a hybrid or blended working environment are key drivers of the change (see Chapter 1: The Future Clinician as a Partner for Health on page 11). In the Clinician of the Future survey, the majority agreed their roles have already changed considerably (71% of doctors and 68% of nurses). The amount of change by role varied by country, it was higher for doctors in India (87%), Spain (91%), the UK (76%) and USA (75%). Among nurses, agreement was high in the UK (96%) and the USA (85%).

Whether this change is seen as positive or negative differs. Doctors are more likely to consider the change in their role to be more negative – in the Clinician of the Future survey, 53% reported that it has become worse over the last 10 years, versus 38% for nurses.

A notably higher proportion of doctors agreed their roles were a lot or a little worse in Germany (78%), the USA (77%) and the UK (73%), while fewer agreed there has been an improvement in the USA (14%) and the UK (13%).

The opposite was true for doctors in China, who were more positive about their roles today compared to 10 years ago: 60% said their roles had improved a lot or a little, and only 21% noted a decline.

Statement: The role of the doctor has changed considerably

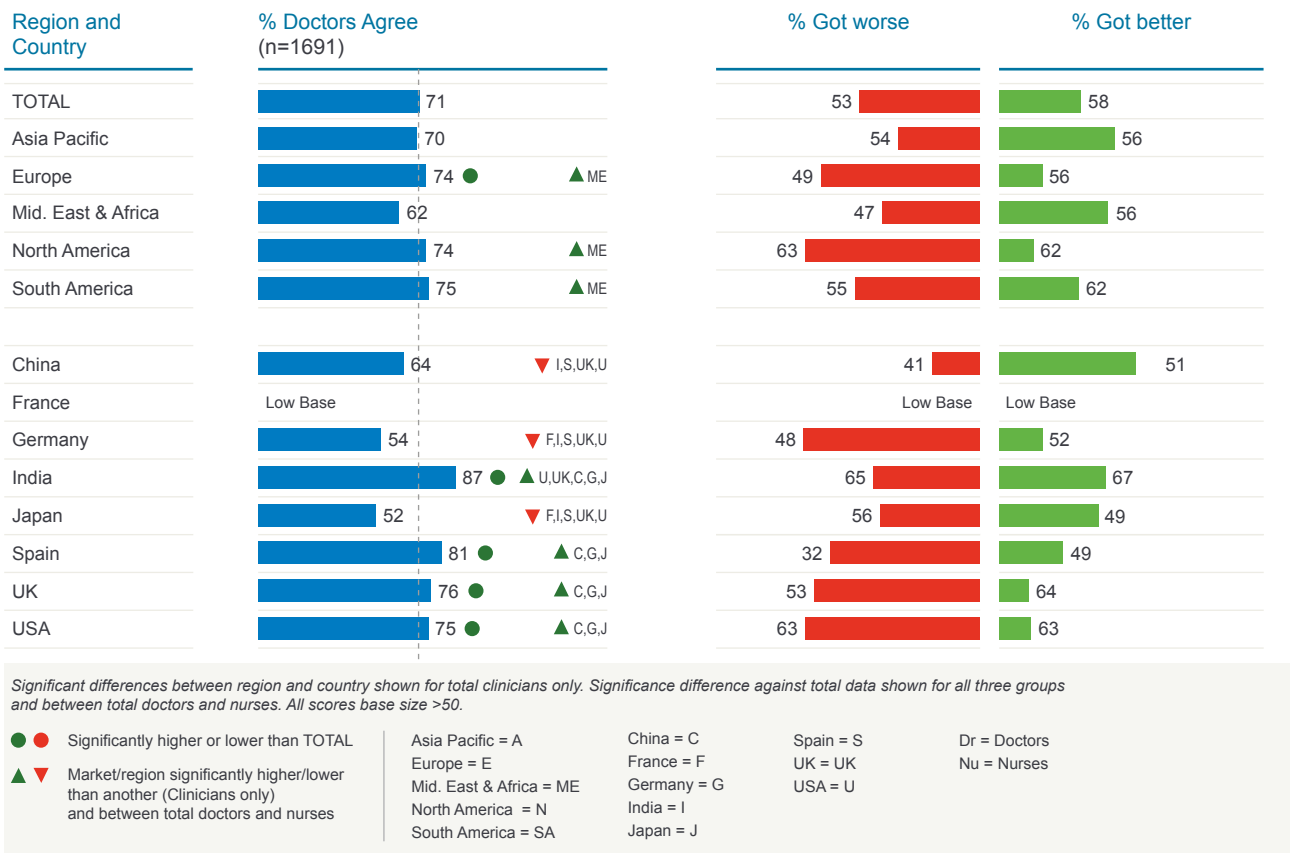


Fig 46: Question: To what extent do you agree or disagree with each of the following statements with regards to trends you have noticed over the past 10 years (from 2011 to 2021)? The role of the doctor has changed considerably. For more information on base sizes see Appendix on page 115.

A similar pattern can be seen for nurses. In the Clinician of the Future survey, a high proportion of respondents agreed the role of a nurse has become significantly worse over the last decade in France (74%) and Germany (84%). Conversely, far more believe the nurse's role has improved in APAC markets like China (72%).

Clinicians believe nurses are playing a stronger and more influential role in the management of patients. New roles are emerging with greater responsibility for diagnosing and prescribing treatment, such as the nurse practitioner. While this is no doubt intended in part to alleviate pressure on doctors, clinicians believe it is putting added pressure on nurses.

The doctor's role is also changing in parallel. As nurses take on more responsibilities, some doctors say they feel less empowered and less in control.

"Nursing colleagues have increased responsibility of care with minimal legal protection and frankly embarrassingly laughable pay. There is an expectation for them to combine care giving, management, and even clinical acumen over a previously mainly care giving role. This is with limited training opportunities, less support, and poor staffing. A nurses role has become more complex and more stressful without improving their pay or amenities."

Clinician, UK, who responded to the Clinician of the Future survey.

Statement: The role of the nurse has changed considerably

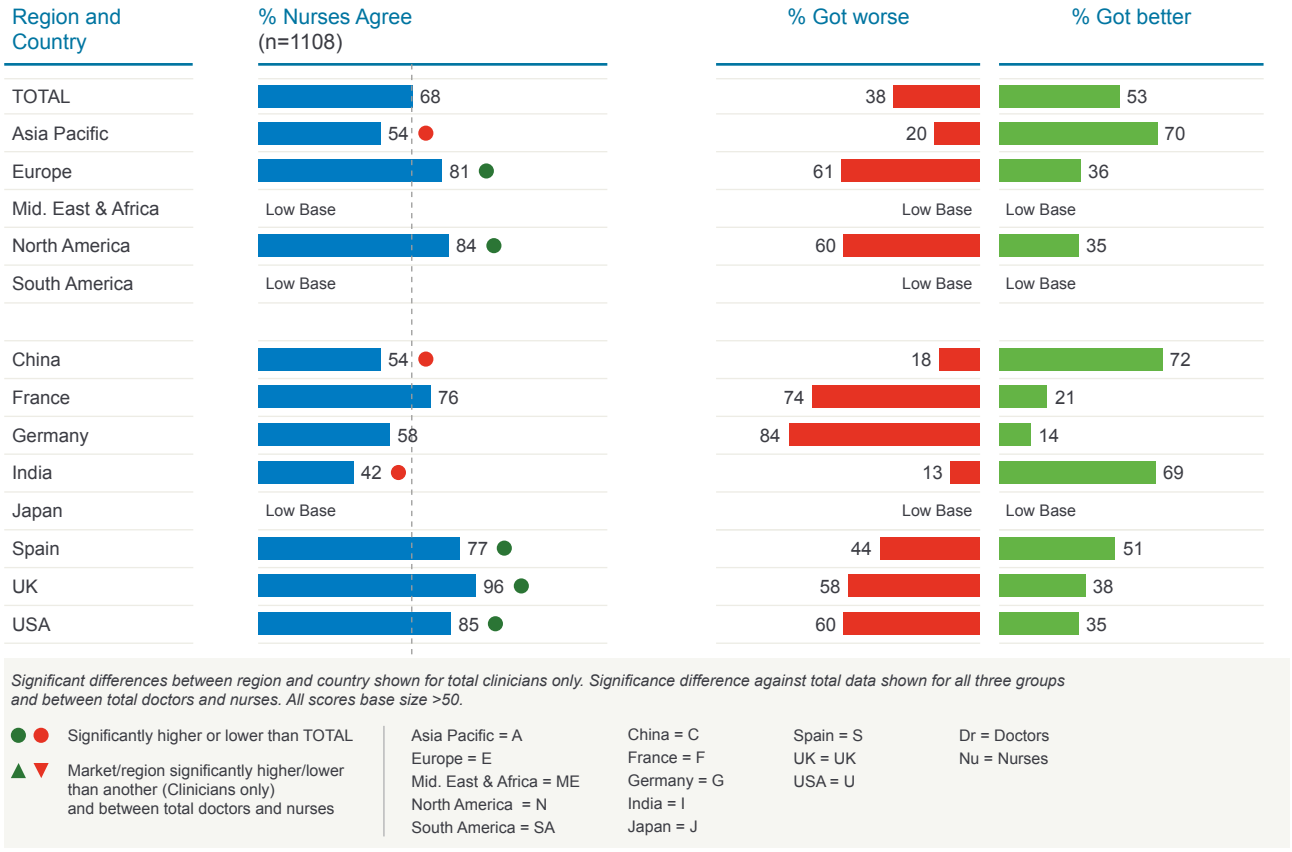


Fig 47: Question: To what extent do you agree or disagree with each of the following statements with regards to trends you have noticed over the past 10 years (from 2011 to 2021)? The role of the nurse has changed considerably. For more information on base sizes see Appendix on page 115.

Meanwhile, doctors are increasingly pushed to spend more time on tasks not directly involving patients. The clinician's role almost always involves direct patient care – in the Clinician of the Future survey, 92% of respondents agreed with this. But patient care is one of a growing number of responsibilities. In the survey, clinicians agreed they are responsible for teaching or education (70%), leadership or administration (44%), medical research (36%) and informatics (18%). Already stretched across varying tasks and responsibilities, clinicians face further changes in their roles that are likely to affect their wellbeing.

Clinicians are also under increasing pressure, with performance metrics and quality measures affecting their jobs. Such metrics – for example, length of stay, re-admission rate, waiting times and patient satisfaction – were identified by 90% of clinicians surveyed as a key driver of change. This differs regionally: performance metrics are thought to have a significantly larger impact in APAC and NOAM than in MEA and Europe.

Driving change in healthcare:
Performance metrics/ quality measures
(e.g. length of stay, re-admission rate, waiting times, patient satisfaction)

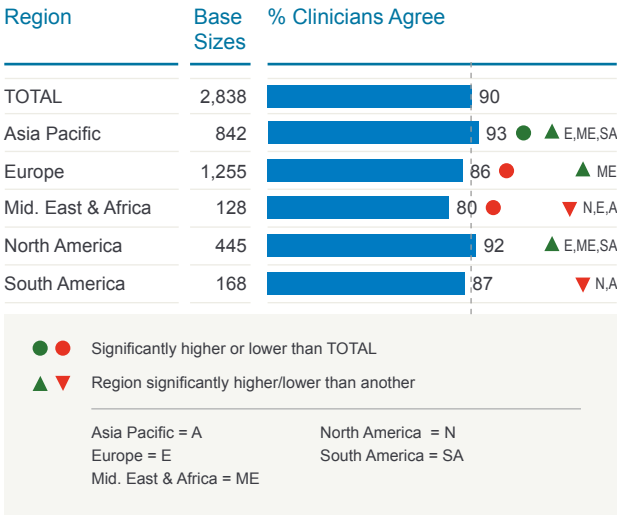


Fig 48: Question: Please think about how healthcare within the primary country that you work in is being impacted by various situations that have risen/ developed over the last decade (in the past 10 years from 2011 to 2021). To what extent do you feel each of the following are driving change in healthcare, if at all. % to some/great extent for statement: Performance metrics/ quality measures (e.g. length of stay, re-admission rate, waiting times, patient satisfaction). For more information, see the Methodology section on page 109.

There's an app for that

The rise of digital health is driving change in two directions. On one hand, it has the potential to lighten the administrative burden on clinicians, incorporating artificial intelligence (AI) and machine learning to save them time. In the future, it promises to become a useful support for clinical decisions. On the other hand, to benefit from digital technologies, clinicians need to upskill – to be able to use the technology, understand how it can support them and feel confident to help patients to use it when appropriate (see Chapter 3: The Future Tech-Savvy Clinician on page 51).

Many clinicians who participated in the Clinician of the Future study already feel unsupported in the shift from traditional to digital: they do not currently have the time to learn the value of the technology or foster the belief in their ability to use it (see Chapter 3: The Future Tech-Savvy Clinician on page 51). The more patient data they have, the more overwhelming it becomes, ultimately taking time away from patient care rather than improving it.

Being behind on digital know-how makes the day-to-day work increasingly difficult, and to catch up requires 'pajama time', therefore negatively affecting work–life balance.

During the pandemic, hospitals have faced a constant stream of COVID-19 patients, and many clinicians have had to push back their scheduled appointments and surgeries, preventing them from treating many patients. This unprecedented situation has already led to permanent changes – positive and negative – in clinicians' roles and healthcare more generally. In the Clinician of the Future survey, 97% of respondents agreed the COVID-19 pandemic is a key driver of change.

A systematic review of studies on the prevalence of depression during the COVID-19 pandemic showed that more than one in five healthcare workers experienced mental health problems during the pandemic.[11] The meta-analysis of 65 studies involving 97,333 healthcare professionals in 21 countries revealed high rates of mild depression (21.7% of people), anxiety (22.1%) and PTSD (21.5%).

Resilience has become a buzzword across all industries, but especially in healthcare. Clinicians have dealt with the physical exhaustion of working long shifts and wearing personal protective equipment (PPE) for 12 hours or more at a time. They have also dealt with the emotional exhaustion of losing huge numbers of patients. This is on top of the challenges everyone has faced, and the feelings of fear, loneliness, frustration and confusion.[12] In many areas, this extremely difficult situation for clinicians has been exacerbated by mistreatment by patients. People who were scared and grieving often lashed out at clinicians.[13]

In 2020, during the first lockdowns, a wave of support for clinicians rippled through many countries – Italy, the USA, the UK – in the form of a weekly round of applause for key workers. Once a week for ten weeks, people in the UK stood outside their front doors and leaned out of their windows to clap in appreciation of the difficult work healthcare staff were doing.

However, when a return to the applause was suggested in the UK in early 2021, nurses responded to a request by the *Nursing Times* for comment, saying they would prefer people to adhere to the guidelines rather than clap for them.[14] They also asked for better pay rather than 'hollow' appreciation, starting the Twitter hashtag #CashNotClaps.

Many clinicians feel underappreciated by their employers. Despite the pandemic, many clinicians who responded to the Clinician of the Future survey shared that they still often feel pressured to meet unrealistic targets.

"With COVID it was made clear that our employers don't value us as they don't seem to care about our health and safety. For example mid COVID, they told us our productivity had to increase again. I get that healthcare is a business but it was so stressful thinking about RVUs in the midst of COVID."

Clinician, USA, who responded to the Clinician of the Future survey.

Yet in some countries, including China, the pandemic appears to have ushered in a wave of respect for clinicians. In the China roundtable held for the Clinician of the Future study, key opinion leaders noted that trust in doctors is increasing, and that their recognition is at a peak today. Although the COVID-19 pandemic has undoubtedly had an effect on this, it is also likely the result years of healthcare reform in China.[15]

"After the COVID-19 pandemic, the social status of Chinese doctors has been significantly improved than before, the masses have more trust in doctors, and the country has paid more attention to medical care."

Clinician, China, who responded to the Clinician of the Future survey.

"After the new coronavirus, the masses have accepted the position that nurses are angels in white, patients no longer think nurses are waiters, and the country has also strengthened its emphasis on nursing."

Clinician, China, who responded to the Clinician of the Future survey.

The future: can tech make up for shortages?

Clinicians expect today's personnel shortages in healthcare to continue in the future: Clinician of the Future survey respondents believe there will be a shortage of nurses (74% agreed globally) and doctors (68% agreed globally). This may be a bigger factor in North America and Europe, and especially in the UK, where just under 90% of clinicians expect shortages.

Statement: There will be a shortage of nurses

Region and Country	Base Sizes	% Clinicians Agree
TOTAL	2,838	74
Asia Pacific	842	67 ● ▲SA
Europe	1,255	85 ● ▲A,ME,SA
Mid. East & Africa	128	59 ●
North America	445	83 ● ▲A,ME,SA
South America	168	55 ● ▼N,E,A
China	499	71 ▲I
France	82	86 ● ▲C,I,J
Germany	162	97 ● ▲U,UK,C,I,J,F
India	161	52 ● ▼U,UK,C,G,F,S
Japan	63	60 ●
Spain	239	71 ▲I
UK	604	88 ● ▲U,C,I,J
USA	434	83 ● ▲C,I,J

Significant differences between region and country.

●● Significantly higher or lower than TOTAL

▲▼ Market/region significantly higher/lower than another

Asia Pacific = A	China = C	Spain = S
Europe = E	France = F	UK = UK
Mid. East & Africa = ME	Germany = G	USA = U
North America = N	India = I	
South America = SA	Japan = J	

Fig 49: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? % agree with statement: There will be a shortage of nurses.

Statement: There will be a shortage of doctors

Region and Country	Base Sizes	% Clinicians Agree
TOTAL	2,838	68
Asia Pacific	842	59 ●
Europe	1,255	82 ● ▲N,A,ME,SA
Mid. East & Africa	128	67 ▲SA
North America	445	74 ● ▲A,SA
South America	168	51 ●
China	499	67 ▲I,J
France	82	82 ● ▲C,I,J
Germany	162	85 ● ▲U,C,I,J
India	161	41 ● ▼U,UK,C,G,F,S
Japan	63	40 ● ▼U,UK,C,G,F,S
Spain	239	77 ● ▲C,I,J
UK	604	86 ● ▲U,C,I,J
USA	434	74 ● ▲C,I,J

Significant differences between region and country.

●● Significantly higher or lower than TOTAL

▲▼ Market/region significantly higher/lower than another

Asia Pacific = A	China = C	Spain = S
Europe = E	France = F	UK = UK
Mid. East & Africa = ME	Germany = G	USA = U
North America = N	India = I	
South America = SA	Japan = J	

Fig 50: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? % agree with statement: There will be a shortage of doctors.

As well as agreeing there will likely be shortages in the future, many clinicians consider this a pressing concern: in the survey, 27% identified the need for more healthcare professionals as a top-3 priority support area, increasing to over 40% in the UK.

The clinician of the future is likely to face personnel shortages that affect patient care. Too few clinicians could mean less time with each patient and lower access to healthcare within the population. Many clinicians already feel unable to provide the level of patient care they would like to, which further affects their job satisfaction.

Adapting to new roles

Clinicians expect their roles to change in the future, and this will bring the need for further adaptation. Those who responded to the Clinician of the Future survey expect their roles to become:

- More prevention-focused – they predict public health will be a key priority in their roles, as healthcare moves towards a preventive approach. They expect more patients to be attending mandated regular health check-ups, which could mean they interact more often with people when they are well rather than ill. (See Chapter 2: The Future Total Health Clinician on page 35).
- Less location-specific – clinicians expect to interact with patients outside of the clinical setting more often, either in the patient's home or remotely. (See Chapter 1: The Future Clinician as a Partner for Health on page 11).
- More reliant on data and tech – clinicians predict they will be experts in the use of digital health technologies (67%), and that scientific research will be much better integrated into clinical practice (72% globally). As they expect to deliver more personalized treatment, real-time analytics will be critical. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

Statement	% clinicians agreed globally
Managing public health will be a key priority within a clinicians' role	73%
The majority of healthcare will be provided in a patient's home instead of a healthcare setting (e.g. hospital/ clinic)	49%
The majority of consultations between clinicians and patients will be remote	63%
Personalized treatment approaches will be more widely used	77%
Real time patient analytics will be critical to personalized care	77%
Scientific research will be much better integrated into clinical practice	72%
A much higher proportion of patients will be attending mandated regular health check-ups	56%

Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Base=2,838.

One of the longer-term results of these changes could be that people are less reliant on clinicians. A shift to preventive care could potentially reduce the burden of chronic illness and, in the longer term, result in people visiting healthcare facilities less often. Extended vaccination programs could continue to reduce infectious disease.[16] Digital health technologies could take on many of the tasks currently carried out by clinicians, including triage, and could give patients more control of their own healthcare (see Chapter 1: The Future Clinician as a Partner for Health on page 11).

Balancing the benefits of technology

Similarly, the rise of digital health technologies is often hailed as the answer to an overburdened healthcare system: digital devices and software are already being designed to support clinicians with their administration and medical decisions.

Clinicians believe that, in the future, information from scientific research studies, EMR/EHR and connected health devices will together form digitalized clinical decision support systems (CDSS). These will aim to support more accurate diagnoses and effective treatment plans while reducing the administrative burden for clinicians.

Digital developments and the predicted increase of scientific knowledge being incorporated into clinical care are likely to require big adjustments. Clinicians may need to adapt to a new way of obtaining, storing and accessing knowledge. Traditional medical training involves memorizing a vast amount of information and accessing the knowledge when needed. Although clinicians have above-average retention of the knowledge they learned in medical school,[17] the knowledge base has grown, making it increasingly difficult to remember everything. In the future, more emphasis will likely be on their heuristic knowledge, while technology takes on the encyclopedic role.

"Medical knowledge is racing away. One of the changes for future Clinicians is that they will need to be comfortable with the notion that they can't carry all in their heads anymore and they haven't been able to for decades, admit it. Don't be afraid to use decision support systems."

Dr Stan Shepherd, UK, who attended the Clinician of the Future UK roundtable.

Although digital health technologies aim to support clinicians aim to support them, globally 69% of clinicians surveyed believe that digital technologies will be a challenging burden on their responsibilites in the future, with this figure rising to 80% in North America. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

Since clinicians who took part in the Clinician of the Future study expect staff shortages in the future, along with the added pressure of a growing, aging population, it seems reasonable that they do not expect to have enough time to learn how to use new technologies and apply the data. Continuous learning is already frequently happening during 'pajama time'. If this continues in the future, the rise of digital health technology could have an overall adverse effect on clinicians' wellbeing and ultimately contribute to burnout rather than reducing it.

How do we get there?

A robust, motivated workforce is essential for a sustainable functioning healthcare system.[18] Engaged, valued clinicians would be less likely to leave the profession and at lower risk of burnout, especially if they were part of a fully staffed team.

Focus on clinician wellbeing

Clinician wellbeing is recognized as vital to helping reduce the pressures on clinicians, enabling greater job satisfaction and ultimately a better work–life balance sustained over a period of time. This would help limit staff shortages, compounding the positive effect. There could be other benefits to reducing pressures. According to the British Medical Association (BMA)'s 2018 survey of its members in the UK, people most often attributed bullying and harassment to people being under pressure.[19] Reducing the pressures the system puts on clinicians, they say, could "help to develop positive working relationships across the NHS."

Technology will likely play a role in improving clinicians' wellbeing. Although many identified technology as a future challenge, digital solutions designed with and for clinicians have the potential to reduce the burden on clinicians. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

As wellbeing programs become more common,[20] they could be supported by technology. For example, future software could potentially monitor changes in clinicians' facial expression or voice during telemedicine appointments and enable access to online knowledge hubs to provide support.

Ensure a complete workforce

The healthcare sector not only supports people's health and wellbeing, but also contributes to national and international economic growth. As such, the UN High-level Commission on Health Employment and Economic Growth has called for investments in the health workforce.[21]

Investment and more resources will help relieve the burden, but improving recruitment and retention is at the heart of solving the problem of clinician shortages. Improving clinician wellbeing will help keep clinicians and make the roles more attractive.

> *"If hospitals had the right staffing it would be an enjoyable job."*
>
> *Nurse, UK, who responded to the Clinician of the Future survey.*

Improving public perception

Many clinicians reported positive change in public perception of their roles during the COVID-19 pandemic, especially in APAC. Awareness and appreciation days, such as National Nurses' Day on 6 May and Chinese Doctors' Day (**中国医**师节) on 19 August, help maintain a positive public image.[22] This encourages more positive interactions with patients and helps boost medical school applications and recruitment.

Throughout this study, clinicians made suggestions to improve their roles, from allocating more time for continuous learning to developing a more preventive healthcare system. A lack of control, and a focus on the bottom line rather than patient care were at the core of many frustrations. Clinicians recognize the critical role that government policies play in driving change in healthcare: in the Clinician of the Future survey, 89% of clinicians globally agreed policy plays a critical role in driving change. Agreement was higher in Germany (96%), China (94%) and the USA (93%). Involving clinicians in the development of their roles and enabling them to work closely with policy makers will be critical to ensuring their roles are well adapted for the future.

Question: To what extent do you feel government policies are driving change in healthcare?

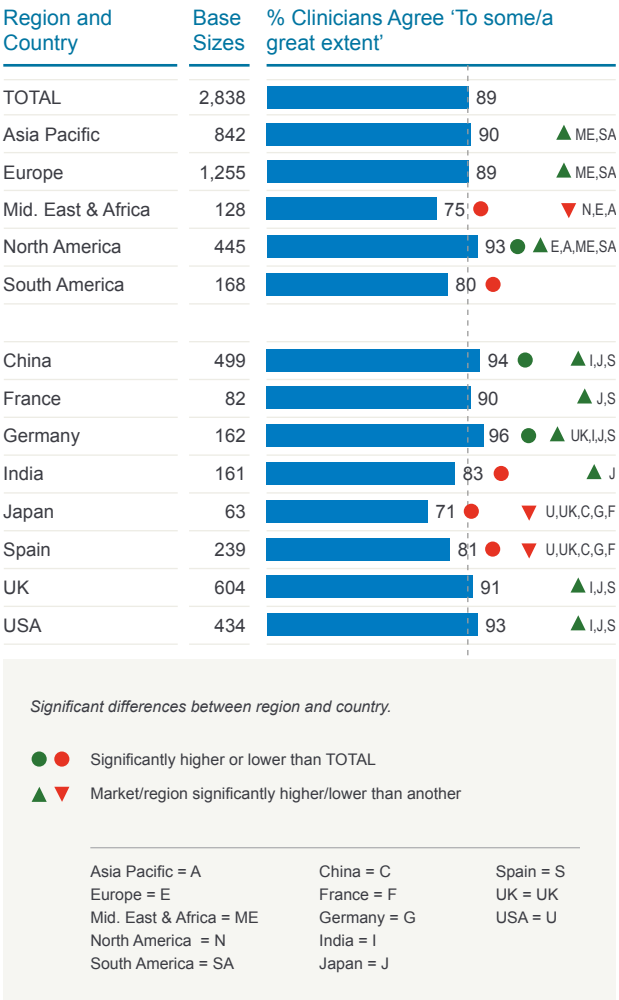


Fig 51: Question: Please think about how healthcare within the primary country that you work in is being impacted by various situations that have risen/ developed over the last decade (in the past 10 years from 2011 to 2021). To what extent do you feel each of the following are driving change in healthcare, if at all? % To some/great extent: Government policies.

Recruitment through optimized training

Medical education will be key to addressing clinician shortages, reducing burnout and ensuring clinicians are ready to keep up with new approaches. Globally, 83% of clinicians who responded to the Clinician of the Future survey agreed today's training needs to be overhauled to keep pace with advances, including the introduction of new technologies.

Evolving medical education is relevant for all three of clinicians' top priorities for greater support in 2031, as identified in the Clinician of the Future survey:

Healthcare training and education to stay up to date (38%) – The increased integration of new scientific knowledge into clinical work and the fast pace of change in technology and precision medicine could be addressed with optimized medical training and continuous education.

Training in the effective use of digital health technologies to assist in the delivery of patient care remotely (38%) – With sufficient ongoing training opportunities, clinicians could benefit from the support of digital technologies.

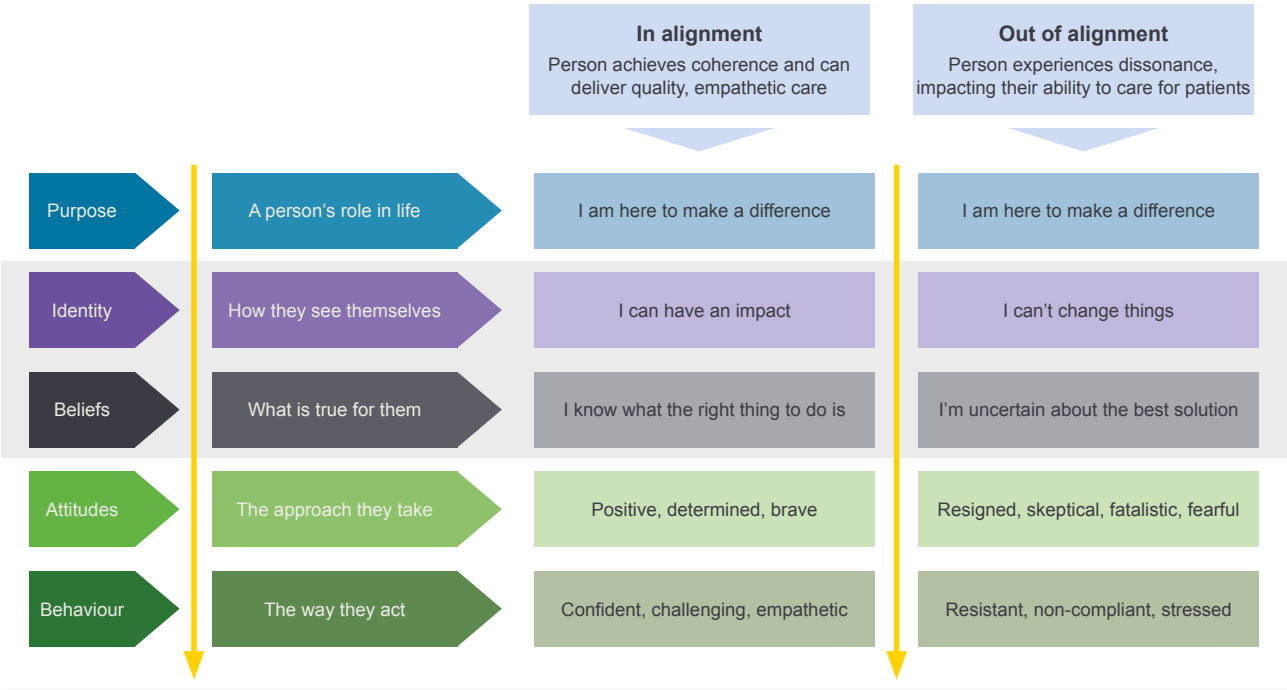
More healthcare professionals (27%) – Medical education is the gateway to a career in healthcare – ensuring it is accessible to a broader and more diverse population could help build the workforce from the bottom up. Delivering education online could also increase capacity for more students.

In the US roundtable held for the Clinician of the Future study, key opinion leaders discussed the importance of education. They noted that applications to medical schools are still rising, along with the desire to make a bigger impact by taking on a more public role in supporting people's health. If those people can be offered the skills to start their careers and the opportunity for lifelong learning to continue them, many challenges could be solved.

However, clinicians will need the time for continuous learning. Having dedicated time – not just 'pajama time' – for learning would ensure they can keep up to date, have enough time for patients and maintain a good work–life balance. As noted in the UK roundtable, today there is insufficient time to do this, which inhibits clinicians' motivation to take up new technologies.

Beyond the time to learn new approaches and knowledge, clinicians recognized that they will need belief in their own abilities, agency and empowerment to succeed in the future.

Lifelong learning plays an important role in clinicians cultivating belief in their abilities. With self-belief, they could be more optimistic about their potential impact and happier in their roles.



Today's challenges	Action	Tomorrow's opportunities
➤ Burnout	➤ Focus on clinician wellbeing	➤ A resilient workforce
➤ Imbalance	➤ Ensure a complete workforce	➤ No shortages
➤ Depleting joy	➤ Recruit through optimized training	➤ Fulfilling roles

Chapter 4: References

1 Morning Consult. Voices from the Front Lines of Health Care: Part II. October 2021. https://morningconsult.com/2021/10/04/health-care-workers-series-part-2-workforce/

2 Kane, L. 'Death by 1000 Cuts': Medscape National Physician Burnout & Suicide Report 2021. Medscape. 22 January 2021. https://www.medscape.com/slideshow/2021-lifestyle-burnout-6013456

3 Peckham, C. Medscape Lifestyle Report 2016: Bias and Burnout. Medscape. 13 January 2016. https://www.medscape.com/slideshow/lifestyle-2016-overview-6007335#1

4 International Labour Organization. Improving employment and working conditions in health services. April 2017. https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_548288.pdf

5 Long L. et al. Understanding why primary care doctors leave direct patient care: a systematic review of qualitative research. BMJ Open. 2020. 10:e029846. https://doi.org/10.1136/bmjopen-2019-029846

6 World Health Organization (WHO). Health workforce. https://www.who.int/health-topics/health-workforce#tab=tab_1

7 United Nations (UN). Sustainable Development Goal 3. https://sdgs.un.org/goals/goal3

8 United Nations Statistics Division (UNSD). Sustainable Development Goal 3 report 2021. https://unstats.un.org/sdgs/report/2021/goal-03/

9 Campbell, D. England's NHS and care services need 1.1m extra staff by 2031, finds study. 1 October 2021. https://www.theguardian.com/society/2021/oct/01/englands-nhs-and-care-services-need-11m-extra-staff-by-2031-finds-study

10 Amnesty International. Global: Amnesty analysis reveals over 7,000 health workers have died from COVID-19. 3 September 2020. https://www.amnesty.org/en/latest/news/2020/09/amnesty-analysis-7000-health-workers-have-died-from-covid19/

11 Li, Y. et al. Prevalence of depression, anxiety and post-traumatic stress disorder in health care workers during the COVID-19 pandemic: A systematic review and meta-analysis. PLOS ONE. 10 March 2021. https://doi.org/10.1371/journal.pone.0246454

12 Farkhad, B. F. and Albarracín, D. Insights on the implications of COVID-19 mitigation measures for mental health. Economics & Human Biology. January 2021. Volume 40. https://doi.org/10.1016/j.ehb.2020.100963

13 Harmon, G. E. Threats, intimidation against doctors and health workers must end. AMA. 3 February 2022. https://www.ama-assn.org/about/leadership/threats-intimidation-against-doctors-and-health-workers-must-end

14 Mitchell, G. Clap for Heroes: Nurses say they do not want return of applause. Nursing Times. 7 January 2021. https://www.nursingtimes.net/news/coronavirus/clap-for-heroes-nurses-say-they-do-not-want-return-of-applause-07-01-2021/

15 Yip, W. et al. 10 years of health-care reform in China: progress and gaps in Universal Health Coverage. 28 September 2019. Volume 394, Issue 10204, 1192-1204. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)32136-1/fulltext

16 Rappuoli R. et al. Vaccines, new opportunities for a new society. Proc Natl Acad Sci U S A. 26 August 2014. 111(34):12288-93. https://doi.org/10.1073/pnas.1402981111

17 Custers, E. J. and Ten Cate, O. T. Very long-term retention of basic science knowledge in doctors after graduation. Med Educ. April 2011. 45(4):422-30. https://doi.org/10.1111/j.1365-2923.2010.03889.x

18 National Governors Association. Healthcare Workforce Healthcare Workforce. 27 December 2021. https://www.nga.org/center/issues/healthcare-workforce/

19 The BMA (British Medical Association). Racial inequality in health and social care workplaces. 26 February 2021. https://www.bma.org.uk/media/3905/bma-response-to-ehrc-race-inquiry-feb-2021.pdf

20 National Academy of Medicine. National Academy of Medicine Action Collaborative on Clinician Well-Being and Resilience. https://nam.edu/initiatives/clinician-resilience-and-well-being/

21 International Labour Organization. Health services sector. https://www.ilo.org/global/industries-and-sectors/health-services/lang--en/index.htm

22 National Healthcareer Association. The ultimate list of healthcare awareness dates. 2018. https://info.nhanow.com/blog/the-ultimate-list-of-healthcare-awareness-dates

Clinician of the Future

Chapter 5

The Future Accessible Clinician

ELSEVIER

Health

Addressing equity and access to healthcare

Meet the future accessible clinician.

The clinician of the future will be part of a more equitable healthcare system, focused on ensuring everyone is able to live a long, healthy life. Their workplace extends from traditional settings to patients' homes and community centers, helping them reach vulnerable populations. They build strong relationships with their patients based on being a trusted partner, and they gather environmental as well as medical background information so they can identify services, such as digital access and monitoring tools, in addition to possible housing and financial aid to promote health. They support their patients to maintain their own health and provide information in a format they can understand. Their workplace is committed to equality and they are given ample time for continuous development, including on emerging digital technologies. They are concerned about health inequity, particularly the negative impacts of digital technology, and they advocate for policy that promotes access to health.

Today	Drivers of change	The future	Action
Noncommunicable diseases (NCDs): 94% of clinicians saw the rise of NCDs as a key driver of change. **Money talks:** 68% of clinicians globally agreed there is too much focus on cost rather than care **Inequality at work:** Clinicians note inequalities – racism, the gender pay gap and hierarchy – within the clinical team.	**Inequity:** 81% of clinicians considered health inequity to be driver of change in healthcare. It is likely rising due to several parallel trends. **COVID-19 widened the health gap:** 97% of clinicians agreed the pandemic is a key driver of change. **Empowered patients:** Clinicians believe telehealth is improving access and digital tech is empowering patients.	**Clinicians as advocates:** 73% of clinicians globally identified that in 10 years' time managing public health will be a key priority within their role. **Blended, equal environment:** 49% of clinicians agreed the majority of healthcare will be provided in a patient's home in 10 years' time, and many expect greater equality at work. **Divided patients:** While some will have better access to healthcare, 64% of clinicians agreed the impact of health inequalities will be exacerbated by the greater use of digital health.	➤ Universal healthcare ➤ Digital access ➤ Patient empowerment ➤ Training for health equity ➤ Equality at work

Unless otherwise stated, the figures in this summary table are key findings from the Clinician of the Future survey, conducted with n=2838 clinicians.

Mind the gaps: inequity in healthcare

Clinicians believe inequity – both in terms of access to health and within healthcare systems – is a major driver of change in healthcare. Clinicians will play a pivotal role in transforming access to health; according to the World Health Organization, "The health workforce will be critical to achieve health and wider development objectives in the next decades."[1] To do that, they will need equality in employment and changes in education.

We have known about health inequity for a long time.[2] It is most visible at the global level: life expectancy differs by as much as 34 years between countries.[3] Risk of mortality differs greatly for many situations. A woman in the UK has a risk of 1 in 5,800 of dying from pregnancy and childbirth; in sub-Saharan Africa, a woman's risk is 1 in 36.[4]

This inequity in health can be seen in parallel to development. As countries develop, they change from experiencing a greater healthcare burden due to infectious diseases to dealing with more chronic, noncommunicable diseases (NCDs).[5] In the Clinician of the Future survey, 94% of respondents saw the rise of NCDs as a key driver of change.

Countries transitioning often struggle, people with chronic conditions live longer and are more expensive to treat, can be forced into poverty or die prematurely; 87% of premature deaths due to noncommunicable diseases occur in low- and middle-income countries.[6] The United Nations' Sustainable Development Goals (SDGs) aim to address this inequity, including through SDG3: Ensure healthy lives and promote well-being for all at all ages.[7]

Health inequity is often most visible at the national level, but it exists in all countries.[8] A report released in 2020 showed increases in health inequalities in England, which "points to social and economic conditions, many of which have shown increased inequalities, or deterioration since 2010."[9]

Health inequity: a social issue

Far from being simply a matter of biology, people's health depends on a whole host of factors, including their gender, race and ethnicity, economic status, level of education, occupation and location, and politics also plays a role.[10]

Driving change in healthcare: Rise of chronic diseases (e.g. heart disease, cancer, chronic obstructive pulmonary disease, diabetes)

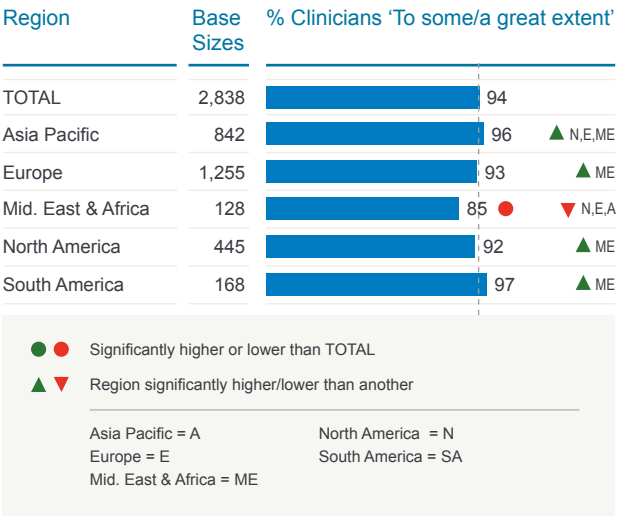


Fig 53: Question: Please think about how healthcare within the primary country that you work in is being impacted by various situations that have risen/ developed over the last decade (in the past 10 years from 2011 to 2021). To what extent do you feel each of the following are driving change in healthcare, if at all? Shows % of respondents selected to some/a great extent for statement: Rise of chronic diseases (e.g. heart disease, cancer, chronic obstructive pulmonary disease, diabetes).

The PROGRESS framework

Health is about more than biology. PROGRESS is an acronym of the widely-accepted social determinants of health:

Place of residence

Race/ethnicity/culture/language

Occupation

Gender/sex

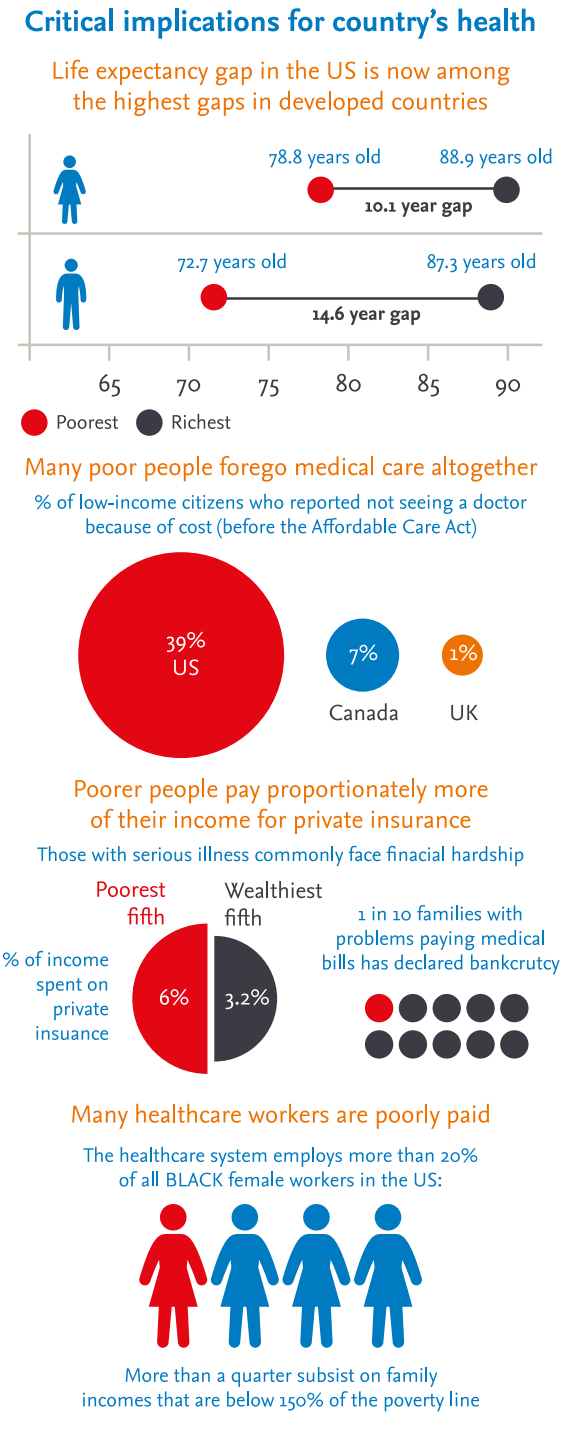
Religion

Education

Socioeconomic status

Social capital

There is plenty of evidence for each of these factors. For example, in Europe, more highly educated people are more likely to assess their health to be good or very good.[11] Overall, women's access to health services is lower than men's in the EU.[12] In the USA, men who are in the top 1% in terms of income will live 15 years longer than those in the bottom 1%.[13] And in the UK, racism has been found to have a direct impact on older people's health, both physically and mentally, by causing stress, and also indirectly impacts their socioeconomic status, which in turn affects their health.[14]



Source: The Lancet.[15]

A 2022 report by the NHS Race & Health Observatory revealed "vast inequalities" in access to healthcare, with the biggest gaps in mental healthcare. Treatment for Black groups was found to be particularly poor.[16]

This provides clinicians with a challenge. In the current system, they can have little impact on these social determinants of health, so they are restricted to treating patients when they're already ill. This was identified as a top-3 priority challenge by 22% of respondents in the Clinician of the Future survey, including 30% of respondents in China. (For more on this topic, see Chapter 2: The Future Total Health Clinician on page 35).

Moreover, clinicians are only able to treat the patients who come to them, leaving groups of people without care. For those who do engage, information can be a barrier: many people cannot understand the information provided about their health, because of its format, complexity or language, for example.[17] In the Clinician of the Future survey, 87% of clinicians agreed that healthcare information for patients need to be improved.

Statement: Healthcare information for patients need to be improved

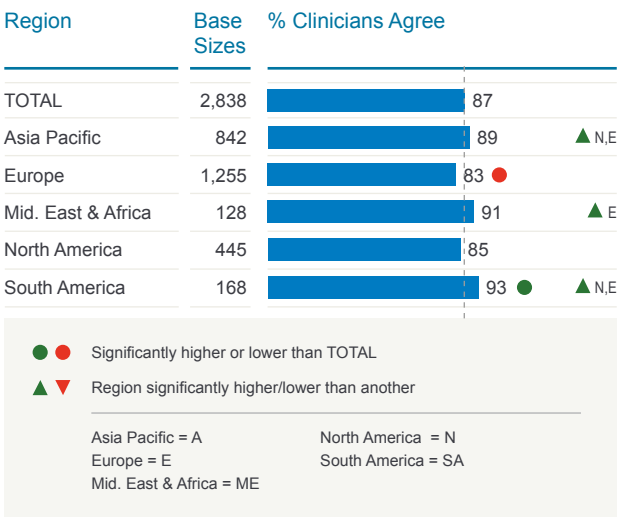


Fig 55: Question: To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare. Shows % of respondents that agree with the statement: Healthcare information for patients need to be improved.

Opening the doors to care

Access is a significant issue globally. On World Health Day 2021, the WHO called on leaders to address health inequities, by giving everyone "secure living and working conditions" and "access to quality health services… without experiencing financial hardship."[18]

As shown in Chapter 2, cost is a fundamental issue for healthcare. In the Clinician of the Future survey, 68% of respondents globally agreed there is too much focus on cost rather than care, rising to 75% of doctors and 88% of nurses in the USA, and 80% of doctors and 99% of nurses in Germany.

Statement: There is too much focus on cost rather than care

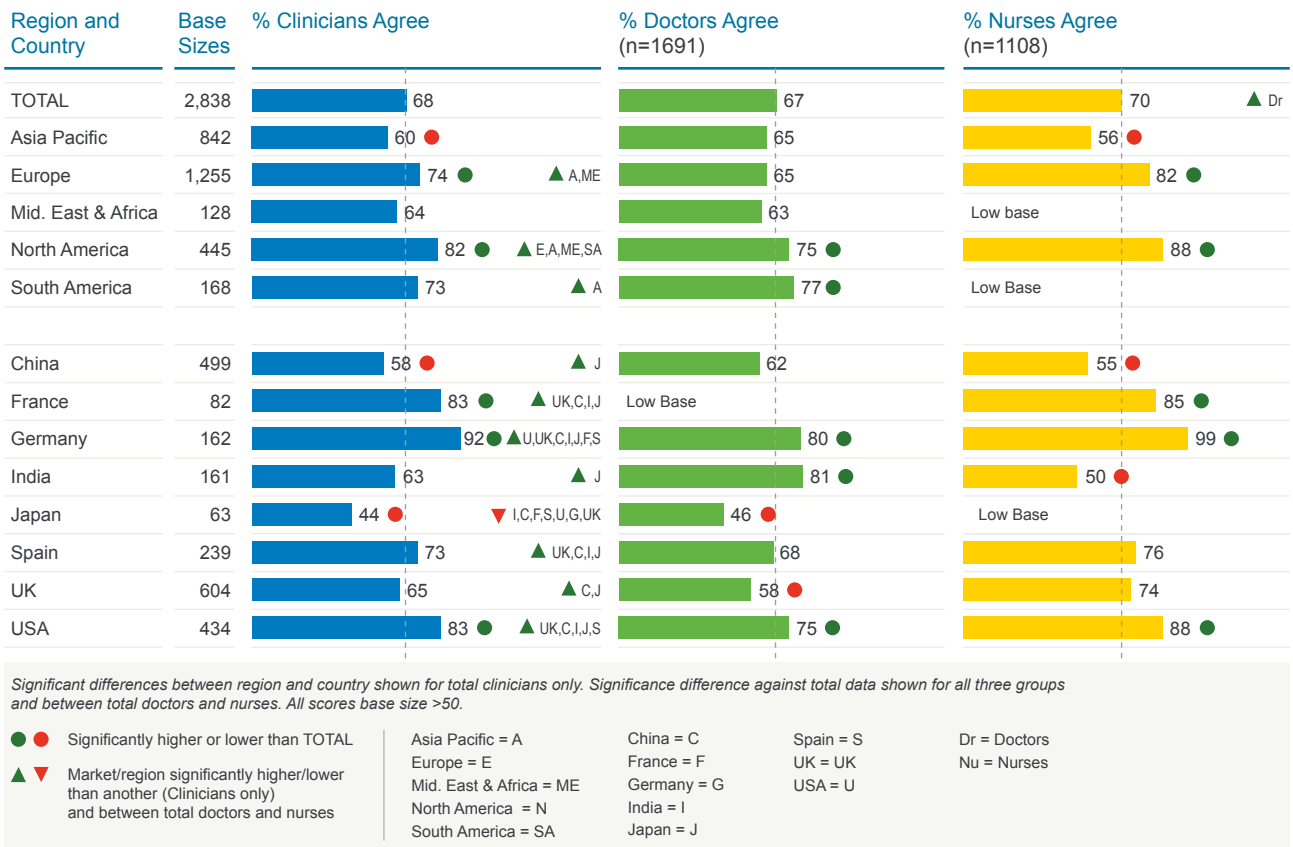


Fig 56: Question: Please think about how healthcare within the primary country that you work in is being impacted by various situations that have risen/ developed over the last decade (in the past 10 years from 2011 to 2021). To what extent do you feel each of the following are driving change in healthcare, if at all? Shows % of respondents selected to some/a great extent for statement: Rise of chronic diseases (e.g. heart disease, cancer, chronic obstructive pulmonary disease, diabetes). For more information on base sizes for doctors and nurses see Appendix on page 115.

Depending on the healthcare structure in place, some patients need to have sufficient insurance or pay out-of-pocket[19] for healthcare services. Even in the EU, which has a high coverage of universal healthcare,[20] on average, one-fifth of health spending is paid by people out-of-pocket on average, increasing to about one-third in Latvia, Bulgaria, Greece and Malta. Countries with higher out-of-pocket spending can see more people facing "catastrophic" payments for healthcare.[21]

Think differently: cost

The World Health Organization identifies cost as a major cause of health inequity, but health inequity is also a huge cost globally. Productivity loss, lower tax payments, higher welfare payments and direct healthcare costs all contribute to this.[22]

In the EU, health inequities cost an estimated 1.4% of GDP. In the USA, inequities lead to about $93 billion in excess medical care and $42 billion in lost productivity annually.[23]

Because of their long-term nature, chronic conditions can be particularly costly. In China, the Guangzhou Biobank study revealed inequity in the treatment of chronic conditions, while there was no inequity apparent in the use of general healthcare.[24] For patients with noncommunicable diseases in China, financial capability appears to be the biggest factor in their access to healthcare. Data from the 2008 Chinese National Health Survey of 56,456 households show that socioeconomic status is the main cause of limited access to healthcare.[25] This was particularly the case for older people without children.[26]

Your zip code can make a bigger difference than your genetic code

Finance is one of three major barriers to access to healthcare tracked by organizations like the OECD and WHO. The other two are waiting times and travel distances, both of which are affected by the availability and distribution of clinicians.[27]

In China, for example, there is not an absolute shortage in terms of clinical resource. However, the clinical workforce is concentrated in major cities, leaving many rural, inland communities without healthcare services.[28] According to experts who participated in the discovery interviews for the Clinician of the Future study, this can mean patients in rural areas have to travel further, wait longer or miss out on care altogether. Similarly, in the UK, there are shortages of key general practice roles, which affect more deprived areas.[29]

Globally there is there is a shortage of general practitioners; although the number of doctors per person in Europe increased by about 15% between 2008 and 2018, the proportion who are GPs was low – only one in five. The shortage is a particular problem for rural areas, where recruiting and retaining GPs is challenging, partly due to the lower "perceived prestige" of general practice.[30]

Inequality at work

Shortages and skewed distribution are global problems, and they are having a significant impact today, contributing to clinicians being overwhelmed. (See Chapter 4: The Future Balanced Clinician on page 73.)

"There has been a staffing shortage in most acute care hospitals for years and 'everyone' acknowledges there are problems yet here we are 10, 15, 20 years later and still beating the same dead horse with no real fix. Patient care suffers when there are staffing shortages, at times resulting in very costly lawsuits, yet the answer is not to fix the issue but blame the nurse."

Clinician, USA, who responded to the Clinician of the Future survey

In addition to feeling overwhelmed, clinicians face a host of inequities and inequalities as employees working within the healthcare system, which reflect those in wider society. For example, there are gender gaps among clinicians, and female doctors are at a disadvantage. According to a 2019 WHO study, there is a gender pay gap of 28% in healthcare globally. Occupation and working hours can explain some of this – for example, women are more likely to work part-time, and this is not possible in all positions. However 11% is still unexplained, which could be indicative of women being paid less than men for doing the same job.[31]

Working towards equality in the healthcare team

Healthcare also has specific issues of inequality, including the perceived gap between doctors and nurses. Clinicians' roles have changed considerably in the last decade, but this change has brought misunderstanding about people's responsibilities.

In the survey, many clinicians noted this inequality. Nurses are often seen as caregivers who look after patients at the bedside, while doctors tend to be considered more highly educated and higher in the hierarchy.

"In Singapore, nurses generally do not have professional autonomy and are often managed by doctors."

Clinician, Singapore, who responded to the Clinician of the Future survey.

However, many clinicians who reported a positive change in their roles noted a move towards greater autonomy, more clinical and diagnostic responsibilities and more specialist training.

"Nurses are more empowered as compared with the previous years. Although there is still a stigma in our country that 'nurses are merely assistants of the doctors', nurses have been more vocal in trying to change the norms of society."

Clinician, Philippines, who responded to the Clinician of the Future survey.

This is leading to positive change, not just for nurses but also doctors.

"The hierarchical structures in the clinic have improved. Doctors and nurses work together more as equals, which is definitely an improvement in the role of doctors."

Clinician, Germany, who responded to the Clinician of the Future survey.

What's driving change?

In the survey, 81% of clinicians considered health inequity to be a major driver of change in healthcare. This inequity is likely increasing due to several parallel trends.

The aging population.

The global population is getting older – and 93% of clinicians surveyed see this as a key driver for change in healthcare. By 2025, 840 million people will be over 65 – 11% of the population. This is happening even faster in China: in 2010, 12.4% of people were over 60, and this is expected to reach 28% in 2040.[32] As digital technology rises, this could widen the gap in access to healthcare.

The rise of noncommunicable diseases (NCDs).

As people are living longer, many more are living with chronic diseases. In the survey, 94% of respondents saw this as a key driver of change (see page 94). NCDs can be expensive to live with, and those without the financial means to pay for their treatment may lack access.

The growing shortage of healthcare workers.

In the survey, 74% of clinicians agreed there will be a shortage of nurses in the future, and 68% agreed there will be a shortage of doctors (see Chapter 4: The Future Balanced Clinician on page 73). The WHO estimates there will be a global shortage of up to 9.9 million doctors, nurses and midwives by 2030.[33] In Europe, the number of clinicians has increased by 10% in the last decade,[34] but even this is unlikely to be enough to cover the increasing number of patients.

The rise of infectious diseases.

86% of clinicians who responded to the survey see this as a key driver of change. The COVID-19 pandemic has focused global attention of the calamitous impact of infectious diseases, which disproportionately affect people living in low- and middle-income countries. In the survey, significantly more nurses in China and India agreed the rise of infectious diseases is driving change. However, climate change is pushing the boundaries of many infectious diseases. For example, Zika virus emerged in the USA for the first time in 2016.[35]

Driving change in healthcare:
The rise of health inequalities

Region and Country	Base Sizes	% Clinicians 'To some/a great extent'
TOTAL	2,838	81
Asia Pacific	842	82 ▲ ME
Europe	1,255	79
Mid. East & Africa	128	73 ● ▼ A,SA
North America	445	81
South America	168	87 ▲ E,ME
China	499	83 ▲ G,J,S
France	82	77
Germany	162	72 ● ▼ U,UK,C
India	161	80 ▲ J
Japan	63	63 ● ▼ U,UK,C
Spain	239	76 ▼ UK,C
UK	604	86 ●
USA	434	81 ▲ G,J

Significant differences between region and country.

● ● Significantly higher or lower than TOTAL

▲ ▼ Market/region significantly higher/lower than another

Asia Pacific = A
Europe = E
Mid. East & Africa = ME
North America = N
South America = SA
China = C
France = F
Germany = G
India = I
Japan = J
Spain = S
UK = UK
USA = U

Fig 57: Question: Please think about how healthcare within the primary country that you work in is being impacted by various situations that have risen/developed over the last decade (in the past 10 years from 2011 to 2021). To what extent do you feel each of the following are driving change in healthcare, if at all? Shows % of respondents selected to some/a great extent for statement: Rise of health inequalities.

Driving change in healthcare:
Rise of infectious diseases

Region and Country	Base Sizes	% Clinicians 'To some/a great extent'
TOTAL	2,838	86
Asia Pacific	842	88 ▲ E,ME
Europe	1,255	81 ●
Mid. East & Africa	128	78 ●
North America	445	89 ▼ E,ME
South America	168	88 ▲ E,ME
China	499	86 ▲ G,F
France	82	68 ● ▼ U,UK,C,I,J,S
Germany	162	72 ● ▼ U,UK,C,I,S
India	161	95 ● ▲ U,UK,C,G,J,F,S
Japan	63	83 ▲ F
Spain	239	85 ▲ G,F
UK	604	84 ▲ G,F
USA	434	89 ▲ G,F

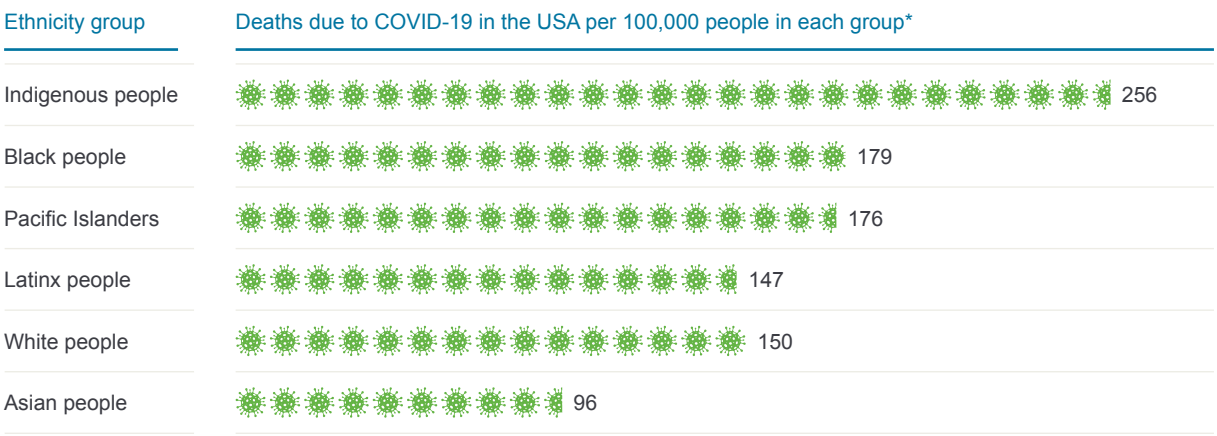
Fig 58: Question: Please think about how healthcare within the primary country that you work in is being impacted by various situations that have risen/developed over the last decade (in the past 10 years from 2011 to 2021). To what extent do you feel each of the following are driving change in healthcare, if at all? Shows % of respondents selected to some/a great extent for statement: Rise of infectious diseases.

The skewed impact of the COVID-19 pandemic

As the most recent example of the rise of infectious disease, the COVID-19 pandemic has amplified health inequity. he disease has directly impacted poor people and ethnic minorities to a disproportionate extent,[36] including those working in healthcare.[37] At the launch of an expert research centre on health inequalities, Lord Victor Adebowale, chair of NHS Confederation, said "The impact of COVID-19 on black and minority ethnic communities and healthcare staff has shone the brightest of lights on racial inequalities and their root causes."[38]

Indirectly, the pandemic has put pressure on many of the social determinants of health, making people more vulnerable to infection and death. For example, some ethnic minorities may find it harder to access information about COVID-19 in their language.[39]

Evidence indicates that ethnic minorities have experienced higher rates of infection, hospitalization and death due to COVID-19. Systemic racism is a contributing factor, including through the over-representation of ethnic minorities in lower-paid roles on the frontline of healthcare. An ongoing investigation by the UK Equality and Human Rights Commission aims to identify the causes of and reduce inequality.[40]



Data from APM Research Lab.[41]

The pandemic's push towards universal access

The WHO argues that the gaps in access to healthcare that existed before the pandemic were already preventing countries from tackling not only health-related issues but also poverty and income inequality.[42] "Ensuring that everyone living in a country has health coverage is a precondition for UHC, not an optional extra," the WHO wrote.

While it has put tremendous pressure on the world's healthcare systems, COVID-19 has also necessitated an international shift to universal access to mitigate the spread and impact of the virus. Countries made fast changes to policy and healthcare systems: migrants had access to healthcare, insurance payments were reduced or suspended, and consultations went digital.

In the USA, where healthcare is cost-driven (see Chapter 2: The Future Total Health Clinician on page 35), Medicaid and the Children's Health Insurance Program (CHIP) help give more people access to insurance. During the pandemic, enrollment in these programs increased by 17.7%: between February 2020 and June 2021, an additional 12,507,181 people enrolled.[43]

More ways to access healthcare

The domain of healthcare is expanding. The traditional healthcare settings – hospitals, clinics, general practitioners' surgeries – are no longer the only places people can access healthcare. While this is good news for many people, it is also increasing health inequity for some groups.

In the community

To ensure vulnerable groups have access to healthcare, teams are expanding to include community workers who provide education.

Not all groups are covered, and many communities still experience growing inequity.

At home

Healthcare institutions increasingly favor ambulatory services, such as offering a patient physiotherapy or even chemotherapy at their home. In 2019, 58.9% of Medicaid's long-term services and supports (LTSS) spending went to home and community-based services.[44]

People without suitable housing or support will miss out on the benefit.

Online

The rise of digital technology in healthcare means people can attend remote appointments with their care teams, arrange their treatments and collect data on their health.

This only benefits people with access to the technology and the internet. Many don't have the financial means, the time or the skill to access healthcare online.

The empowered patient

Clinicians expect the patient of the future to be empowered to manage their own health (see Chapter 1: The Future Clinician as a Partner for Health on page 11). Digital technology is a major driver for this change, but some clinicians believe there is some risk with this trend.

In the US roundtable for the Clinician of the Future study, key opinion leaders discussed the empowered patient; they expect patients who are financially better off and more highly educated will likely have a better healthcare experience because they will have better health literacy and better access. Without changes to access and education, they believe vulnerable populations will not be afforded the benefits of patient empowerment.

The future: better access to health

Clinicians could play an important role in improving future health equity and access to care. Many clinicians already advocate for patients' wellbeing, individually and at the community, national and international level. Clinicians expect their roles to take on a more public health focus in the future, making this aspect of their work more relevant (see Chapter 2: The Future "Total Health" Clinician on page 35). As advocates, clinicians could have a greater influence on policy that affects health, helping improve access to good health. For example, this might involve working within the community to help people improve their health literacy.

In many countries, patients who struggle to pay for treatment today will have access in the future. Although GDP has increased following the pandemic, the recovery has not been as fast as some expected. Over the longer term, growth will likely return to normal levels, and healthcare spending as a percentage of GDP is expected be significantly higher than it is today. Spending on prevention will likely also be higher. With a push from the UN to provide universal healthcare to meet Sustainable Development Goal 3 in particular, many countries will have adjusted their financing. For example, health coverage might be based on residence, and those who cannot afford insurance payments could be exempted (see Chapter 2: The Future "Total Health" Clinician on page 35).

Working in a blended environment

In the Clinician of the Future survey, 55% of clinicians agreed that far more patient care has been taking place in the home over the last decade. In addition, 49% agreed the majority of healthcare will be provided in a patient's home instead of a healthcare setting in 10 years' time. This was highest in China (61%) and lowest in the USA (33%).

Statement: The majority of healthcare will be provided in a patient's home instead of a healthcare setting (e.g. hospital/ clinic)

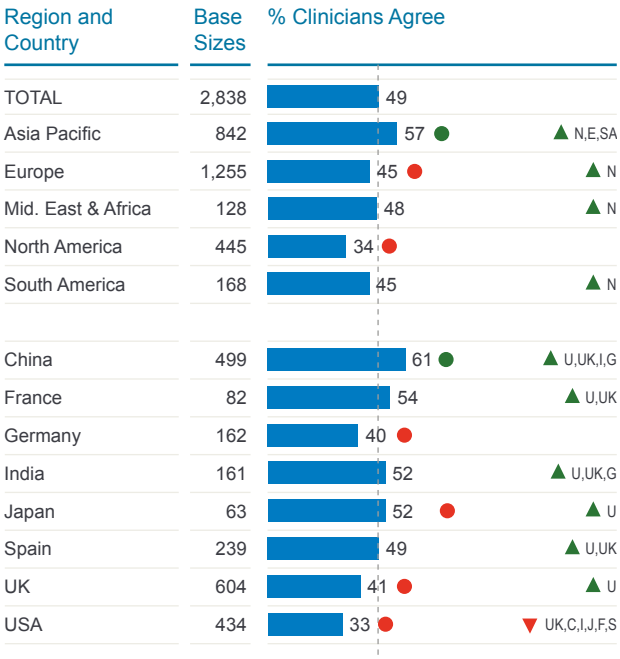
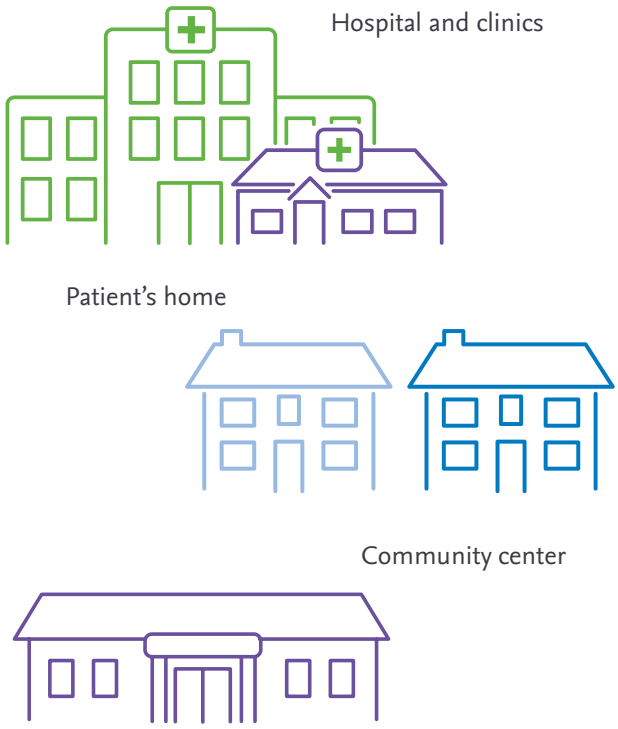


Fig 59: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % agree with statement: The majority of healthcare will be provided in a patient's home instead of a healthcare setting (e.g. hospital/ clinic).

In many cases, this will likely mean treatment is cheaper, reducing the financial burden on the patients and the system. Those with chronic conditions will be better able to afford their treatment, and clinicians will be able to deliver it at home. Where patients are terminal, their palliative care will also take place at home, if they choose that option.

Clinicians' working environments



Geographic barriers to healthcare will likely be less of an issue too. Clinicians will be able to reach patients in remote areas through telehealth and other digital technologies – in the Clinician of the Future survey, 63% of clinicians agreed that the majority of consultations will be remote.

This hybrid working environment has the potential to reduce the burden on clinicians, especially if digital health technology is used for effective remote consultations (see Chapter 3: The Future Tech-Savvy Clinician on page 51). Clinicians hope this will save them time, thus enabling them to spend more time with each patient. This would give them the chance to invest in patients' health literacy. However, there is a risk that clinicians may feel pressured to see more patients with the time they gain.

The patients of the future: a divided group

Clinicians say there is no such thing as a typical patient, and that will be and in the future these variabilities will be even more marked. While many will be more empowered to look after their own health and take on a role at the center of their own care teams, others will be distanced from healthcare due to inaccessible digital technologies, financial and social factors, limited understanding and not enough time.

Clinicians are concerned that both patient empowerment and digital technology could contribute to a wider gap in health access. In the Clinician of the Future survey, 64% believed the impact of health inequalities will be exacerbated by the greater use of digital health. And half of clinicians agreed that telehealth will negatively impact their ability to demonstrate empathy with their patients.

This will lead to changes in clinicians' roles, as they will need to work with patients along a spectrum of empowerment. On a practical level, this might mean clinicians work remotely more often with empowered patients and have more in-person appointments with those who need more support or whose conditions require face-to-face consultations.

A review of inequalities in general practice noted that remote consultations "are likely to be used more by younger, working people, non-immigrants, older patients, and women, with internet-based consultations more by younger, affluent, and educated groups."[45]

One major question about the future is: how will clinicians maintain trust with their patients? Empathy will continue to be an important factor, and to ensure empathy is maintained in the future, clinicians will require training. (See Chapter 1: The Future Clinician as a Partner for Health on page 11).

Equality in the workforce

While the divide between patients may be greater in the future, the divide between healthcare professionals is likely to be smaller. Global movements to drive equality across gender, race and other factors will have had a positive impact on healthcare.

In the survey, 63% of clinicians said they expect the healthcare workforce will be more diverse in the future to better represent the local population. This was especially the case in APAC (75%), particularly in China (81%).

Statement: The healthcare workforce will be more diverse to better represent the local population

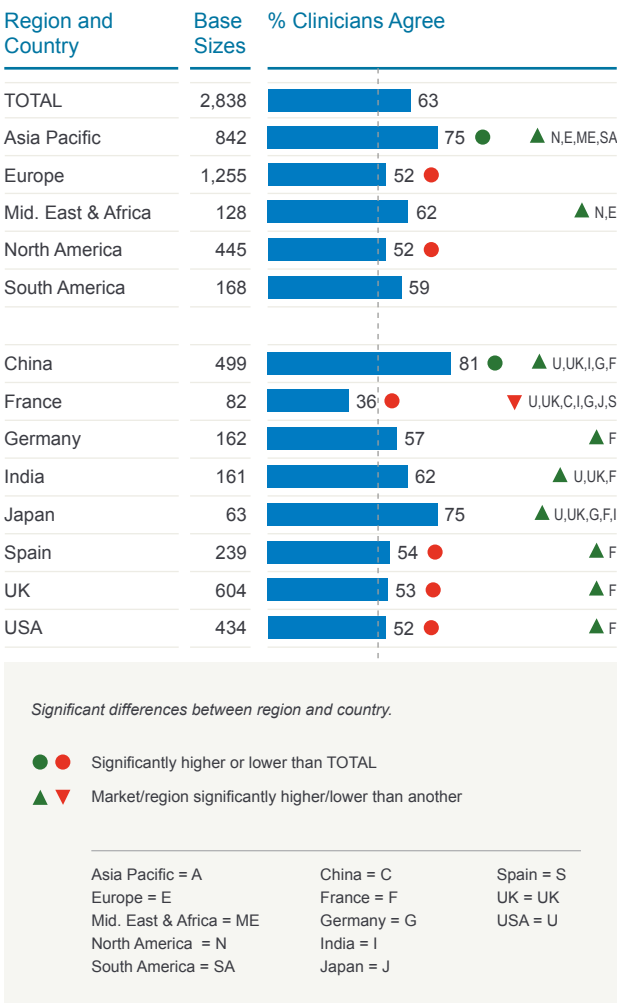


Fig 60: Question: To what extent do you agree or disagree with each of the following statements with regards to your expectations of where healthcare will be in 10 years' time (in 2031)? Shows % agree with statement: The healthcare workforce will be more diverse to better represent the local population.

In most countries, the gap between nurses and doctors is already closing, and this trend will continue in the future in the future. Specialist nurses will likely have more clinical responsibilities, including diagnosing patients and prescribing treatments for certain conditions. Many clinicians expect there to be a less hierarchical relationship between doctors and nurses in the future as roles shift in a more preventive setting (see Chapter 2: The Future "Total Health" Clinician on page 35).

"The hierarchical structures in the clinic have improved. Doctors and nurses work together more as equals, which is definitely an improvement in the role of doctors."

Clinician, Germany, who responded to the Clinician of the Future survey.

How do we get there?

To ensure a more, accessible healthcare system, everyone will need equal access. This means universal health coverage, particularly to improve access for vulnerable groups.

Not every country is starting from the same position on this front, and some will need to make greater changes than others. In order to make progress, the political influence on health inequity needs to be acknowledged, including the conflict between an accessible health system and "powerful global actors in pursuit of other interests such as protection of national security, safeguarding of sovereignty, or economic goals."[46]

Global organizations like the United Nations and the World health Organization are already advocating for universal healthcare and encouraging governments to change and outline a pathway to ensure everyone has access "Countries can reduce access barriers and alleviate financial hardship by exempting poor households and people with chronic conditions from co-payments. Redesigning co-payment policy allows the health system to target those most in need of protection."[47]

The WHO's *Global strategy on human resources for health: Workforce 2030* gives countries a framework for improving access to healthcare.[48] The report is focused on boosting medical education and recruitment, and it sets out recommendations for various stakeholders on policy, investment, regulation and data sharing. The global milestones put down for 2030 require that "all countries are making progress towards halving inequalities in access to a health worker."

Global strategy on human resources for health: Workforce 2030

Objective: To improve health, social and economic development outcomes by ensuring universal availability, accessibility, acceptability, coverage and quality of the health workforce through adequate investments to strengthen health systems, and the implementation of effective policies at national, regional and global levels.

The OECD report *Health for Everyone? Social Inequalities in Health and Health Systems* suggests that any policy strategy to promote inclusive growth and reduce social inequalities more broadly will need to address health-related inequalities.[49]

In China, the government has shared a goal to achieve health equity by 2030. In the Healthy China Action plan,[50] more than 100 health indicators are proposed to improve health behaviors and outcomes. However, the indicators all measure aggregated health status rather than inequity between individuals and people in different socioeconomic groups.[51]

The UK's Health and Social Care Act 2012 added a clause related to healthcare and inequality to address this: "In exercising functions in relation to the health service, the Secretary of State must have regard to the need to reduce inequalities between the people of England with respect to the benefits that they can obtain from the health service."[52]

Increasing (and protecting) digital access

Telehealth and other digital solutions would be integral elements of a more accessible system. Remote tools can be used for triage and refilling prescriptions, ensuring people in remote locations have access to healthcare without needing to travel. Clinicians today use digital tools in their day-to-day work, and this is set to increase in the future. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

To ensure this integration is successful, healthcare systems and institutions will need to invest in the technology. Clinician education will need to incorporate effective use of digital technology – clinicians must be able to choose when remote options are suitable and be able to interact with empathy while using the technology. (See Chapter 3: The Future Tech-Savvy Clinician on page 51).

The rise of telehealth and digital technology has already helped improve many people's access to healthcare during the COVID-19 pandemic. But there are rising concerns that without more permanent intervention, the use of telehealth will decrease – and reduce access with it.

This is of particular concern in the USA, where telehealth consultations were not reimbursed before the pandemic. The government is being urged to ensure telehealth remains accessible and reimbursed in the future, as highlighted by Sandy Marks, AMA's senior assistant director of federal affairs: "…whether Medicare patients who are not in rural areas can continue to receive telehealth services after the COVID-19 public health emergency depends 100% on congressional action."[53]

The role of the empowered patient

As well as investing in the technology itself, healthcare systems and institutions will also need to invest in patient information and education to make sure everyone has access. This will be part of a wider effort to improve patient health literacy.

It will also be helpful to improve access to information about available services, including by providing it in different languages and formats.[54] This will help reduce inequity in access to care as well as reducing risk factors among vulnerable groups.[55]

The relationship between the clinician and the patient will continue to be important improve equity. By building trust with patients, clinicians can encourage them to share more information about their lives. In the future, this social history could contribute to aggregated information that will help address social inequities more broadly.[56]

Training for equality

Although clinician shortages are causing problems, there is good news on the horizon: by 2030, we can expect to see the creation of 40 million new jobs in the healthcare sector, albeit mostly in middle- and high-income countries.[57] Workforce education and training will be a vital step in reducing inequities in health and access to care.[58]

Medical training should include community health education.[59] It should also ensure clinicians understand the different needs of all communities and how best to provide care.[60] One approach could be for clinicians to have placements in a range of organizations, including in deprived areas.[61]

CDC Prevention Research Centers (PRCs): the Pasos Adelante Program[62]

Overweight and obese Latinx people have a higher risk of developing heart disease and diabetes. The CDC wellness program Pasos Adelante (Steps Forward) aims to improve health literacy and enable people to prevent these chronic diseases. Community health workers teach local residents on the US-Mexico border to maintain their health.

Providing an equitable working environment

In order to help address health inequities, clinicians need a working environment in which they are treated equally and fairly and given the freedom to learn and progress. The WHO acknowledged this in 2010: "Despite the high priority accorded to this public health concern, facing up to inequalities in the health workforce remains a major challenge for decision-makers in most countries.[63]

Interventions will begin with education: universities should make sure that students from all socioeconomic backgrounds have fair access to a career in healthcare.[64]

In response to the Equality and Human Rights Commission's inquiry into racial inequality in health and social care workplaces,[65] the British Medical Association (BMA) shared several recommendations, including more "diverse ethnic representation in NHS leadership and management." This can be supported by another of their recommendations: "Developing more inclusive cultures, including by making inclusivity a core competency and developing effective training for all clinicians on the importance of inclusion and value of diverse teams."

As in any other workplace, human resources interventions will help move towards more equitable employment for clinicians, including improved progression opportunities, re-employment programs and more childcare support.[66] This kind of intervention could also have a wider impact on access to healthcare, for example, through financial incentives encouraging clinicians to work in under-resourced.

The progress towards a more equal care team – namely reducing the perceived divide between doctors and nurses – will need to continue. In the Clinician of the Future study, some clinicians expressed concern that education isn't keeping up with changes in nurses' roles.

Education – for doctors and nurses – will also need to be updated to ensure all clinicians keep pace with advances in digital technologies. (See Chapter 3: The Future Tech-Savvy Clinician on page 51). However, there is a risk that 'traditional' clinicians will be left behind in the digital era. Some more experienced clinicians fear they may not get the same support and may not be able to work effectively in this 'new age' of healthcare. Continuing professional development will be therefore key in reducing any emerging gaps.

Clinicians who participated in the Clinician of the Future study also shared concerns that a 'blanket approach' could mean that some specialties are not adequately supported. For example, oncologists may need a higher level of training on new technological therapies, as they will be using them more. As such, digital education may require a different approach for different specialties. By recognizing and addressing potential imbalances in clinicians' digital skills and knowledge, medical schools could contribute to ensuring more equality in the future healthcare workforce.

Today's challenges	Action	Tomorrow's opportunities
➤ Global health inequity	➤ Clinician advocates	➤ Better access to health
➤ Focus on cost above care	➤ Digital access and patient empowerment	➤ Focus on social determinants of health
➤ Inequality in the workforce	➤ Training for health equity	➤ A fair work environment
➤ Divide in patient access	➤ Equality at work	

Chapter 5: References

1 World Health Organization (WHO). Global strategy on human resources for health: Workforce 2030. 7 July 2020. https://www.who.int/publications/i/item/9789241511131

2 Lavizzo-Mourey, R. J. et al. Understanding and Mitigating Health Inequities — Past, Current, and Future Directions. N Engl J Med. 6 May 2021. 384:1681-1684. https://doi.org/10.1056/NEJMp2008628

3 World Health Organization (WHO). Health inequities and their causes. 22 February 2018. https://www.who.int/news-room/facts-in-pictures/detail/health-inequities-and-their-causes

4 Schrecker, T. Globalization and Health. In Kobayashi, A. International Encyclopedia of Human Geography (Second Edition). Elsevier. 2020. 217-222. https://doi.org/10.1016/B978-0-08-102295-5.10386-5

5 Lewis, N. M. Health Inequalities. In Kobayashi, A. International Encyclopedia of Human Geography (Second Edition). Elsevier. 2020. 329-334. https://doi.org/10.1016/B978-0-08-102295-5.10389-0

6 World Health Organization (WHO). Health inequities and their causes. 22 February 2018. https://www.who.int/news-room/facts-in-pictures/detail/health-inequities-and-their-causes

7 United Nations (UN). Sustainable Development Goal 3. https://sdgs.un.org/goals/goal3

8 Barreto, M. L. Health inequalities: a global perspective. Ciência & Saúde Coletiva. July 2017. 22 (7). https://doi.org/10.1590/1413-81232017227.02742017

9 Institute of Health Equity. Marmot Review 10 Years On. February 2020. https://www.instituteofhealthequity.org/resources-reports/marmot-review-10-years-on

10 Ottersen, O. P. et al. The Lancet Commissions. The Lancet-University of Oslo Commission on Global Governance for Health. 15 February 2014. Volume 383, Issue 9917, 630-667. https://doi.org/10.1016/S0140-6736(13)62407-1

11 EuroHealthNet. Health Inequalities Portal. https://health-inequalities.eu/

12 European Institute for Gender Equality. Gender Equality Index 2021: Health. 28 October 2021. https://eige.europa.eu/publications/gender-equality-index-2021-health

13 Inequality.org. Inequality and Health. https://inequality.org/facts/inequality-and-health/

14 Centre for Ageing Better. Ethnic health inequalities in later life. November 2021. https://ageing-better.org.uk/sites/default/files/2021-11/health-inequalities-in-later-life.pdf

15 The Lancet. America: equity and equality in health. https://www.thelancet.com/us-health

16 NHS Race & Health Observatory. New Review Calls for Radical Action on Stark Ethnic Inequalities Across Healthcare. 14 February 2022. https://www.nhsrho.org/news/new-review-calls-for-radical-action-on-stark-ethnic-inequalities-across-healthcare/

17 Jordan, J. E. et al. Conceptualising health literacy from the patient perspective. Patient Education and Counseling, April 2010. Volume 79, Issue 1, 36-42. https://doi.org/10.1016/j.pec.2009.10.001

18 World Health Organization (WHO). World Health Day: Putting equity at the heart of COVID-19 recovery 4 June 2021. https://www.euro.who.int/en/health-topics/Health-systems/health-services-delivery/news/news/2021/4/world-health-day-putting-equity-at-the-heart-of-covid-19-recovery

19 Out-of-pocket refers to payments borne directly by a patient where neither public nor private insurance cover the full cost of the health service.

20 The WHO defines universal healthcare as "all individuals and communities receive the health services they need without suffering financial hardship." World Health Organization (WHO). Universal health coverage (UHC). 1 April 2021. https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc)

21 OECD/European Union. Health at a Glance: Europe 2020: State of Health in the EU Cycle. OECD Publishing. 2020. https://doi.org/10.1787/82129230-en

22 World Health Organization (WHO). Health inequities and their causes. 22 February 2018. https://www.who.int/news-room/facts-in-pictures/detail/health-inequities-and-their-causes

23 Ndugga, N. and Artiga, S. Disparities in Health and Health Care: 5 Key Questions and Answers. Kaiser Family Foundation. 11 May 2021. https://www.kff.org/racial-equity-and-health-policy/issue-brief/disparities-in-health-and-health-care-5-key-question-and-answers/

24 Elwell-Sutton, T. M. et al. Inequality and inequity in access to health care and treatment for chronic conditions in China: the Guangzhou Biobank Cohort Study. Health Policy and Planning. August 2013. Volume 28, Issue 5, 467–479. https://doi.org/10.1093/heapol/czs077

25 Xie, X. et al. Identifying Determinants of Socioeconomic Inequality in Health Service Utilization among Patients with Chronic Non-Communicable Diseases in China. PLOS ONE. 24 June 2014. https://doi.org/10.1371/journal.pone.0100231

26 Zhou, C. et al. Non-use of health care service among empty-nest elderly in Shandong, China: a cross-sectional study. BMC Health Serv Res. 29 July 2015. 15, 294. https://doi.org/10.1186/s12913-015-0974-1

27 OECD/European Union. Health at a Glance: Europe 2020: State of Health in the EU Cycle. OECD Publishing. 2020. https://doi.org/10.1787/82129230-en

28 Wang, Y. et al. Assessing the design of China's complex health system – Concerns on equity and efficiency. Health Policy OPEN. December 2020. Volume 1. https://doi.org/10.1016/j.hpopen.2020.100021

29 Nussbaum, C. et al. Inequalities in the distribution of the general practice workforce in England: a practice-level longitudinal analysis. BJGP Open. October 2021. Volume 5, Issue 5. https://doi.org/10.3399/BJGPO.2021.0066

30 OECD/European Union. Health at a Glance: Europe 2020: State of Health in the EU Cycle. OECD Publishing. 2020. https://doi.org/10.1787/82129230-en

31 World Health Organization (WHO). Gender equity in the health workforce: Analysis of 104 countries. March 2019. https://apps.who.int/iris/bitstream/handle/10665/311314/WHO-HIS-HWF-Gender-WP1-2019.1-eng.pdf

32 World Health Organization (WHO). China country assessment report on ageing and health. 16 February 2015. https://www.who.int/publications/i/item/9789241509312

33 World Health Organization (WHO). Global strategy on human resources for health: Workforce 2030. 7 July 2020. https://www.who.int/publications/i/item/9789241511131

34 World Health Organization (WHO) Regional Office for Europe. Health workforce data and statistics. https://www.euro.who.int/en/health-topics/Health-systems/health-workforce/data-and-statistics

35 Centers for Disease Control and Prevention (CDC). Zika Virus. 25 February 2022. https://www.cdc.gov/zika/index.html

36 OECD/European Union. Health at a Glance: Europe 2020: State of Health in the EU Cycle. OECD Publishing. 2020. https://doi.org/10.1787/82129230-en

37 The BMA (British Medical Association). Racial inequality in health and social care workplaces. 26 February 2021. https://www.bma.org.uk/media/3905/bma-response-to-ehrc-race-inquiry-feb-2021.pdf

38 NHS. NHS England and NHS Confederation launch expert research centre on health inequalities. 30 May 2020. https://www.england.nhs.uk/2020/05/nhs-england-and-nhs-confederation-launch-expert-research-centre-on-health-inequalities/

39 OECD/European Union. Health at a Glance: Europe 2020: State of Health in the EU Cycle. OECD Publishing. 2020. https://doi.org/10.1787/82129230-en

40 Equality and Human Rights Commission. Inquiry into racial inequality in health and social care workplaces. 20 April 2021. https://www.equalityhumanrights.com/en/inquiries-and-investigations/inquiry-racial-inequality-health-and-social-care-workplaces

41 APM Research Lab. The Color of Coronavirus: COVID-19 Deaths by Race and Ethnicity in the U.S. 5 March 2021. https://www.apmresearchlab.org/covid/deaths-by-race

42 World Health Organization (WHO) Regional Office for Europe. COVID-19: a stark reminder of the importance of universal health coverage. 11 December 2020. https://www.euro.who.int/en/health-topics/Health-systems/health-services-delivery/news/news/2020/12/covid-19-a-stark-reminder-of-the-importance-of-universal-health-coverage

43 Center for Medicaid and CHIP Services. June 2021 Medicaid and CHIP Enrollment Trends Snapshot. June 2021. https://www.medicaid.gov/medicaid/national-medicaid-chip-program-information/downloads/june-2021-medicaid-chip-enrollment-trend-snapshot.pdf

44 Medicaid. Medicaid Long Term Services and Supports Annual Expenditures Report: Federal Fiscal Year 2019. 9 December 2021. https://www.medicaid.gov/medicaid/long-term-services-supports/downloads/ltssexpenditures2019.pdf

45 Parker R. F. et al. Inequalities in general practice remote consultations: a systematic review. BJGP Open. 30 June 2021. 5(3). https://doi.org/10.3399/BJGPO.2021.0040

46 Ottersen, O. P. et al. The Lancet Commissions. The Lancet-University of Oslo Commission on Global Governance for Health. 15 February 2014. Volume 383, Issue 9917, 630-667. https://doi.org/10.1016/S0140-6736(13)62407-1

47 World Health Organization (WHO) Regional Office for Europe. COVID-19: a stark reminder of the importance of universal health coverage. 11 December 2020. https://www.euro.who.int/en/health-topics/Health-systems/health-services-delivery/news/news/2020/12/covid-19-a-stark-reminder-of-the-importance-of-universal-health-coverage

48 World Health Organization (WHO). Global strategy on human resources for health: Workforce 2030. 7 July 2020. https://www.who.int/publications/i/item/9789241511131

49 OECD. Health for Everyone? Social Inequalities in Health and Health Systems. 27 September 2019. https://www.oecd.org/health/health-for-everyone-3c8385d0-en.htm

50 The Government of the People's Republic of China. Healthy China Action Plan. http://www.gov.cn/xinwen/2019-07/15/content_5409694.htm

51 Wang, Z. et al. Harnessing the opportunity to achieve health equity in China. The Lancet Public Health. 1 December 2021. Volume 6, Issue 12, E867-E868. https://doi.org/10.1016/S2468-2667(21)00211-5

52 UK Government. Health and Social Care Act 2012. The National Archives. https://www.legislation.gov.uk/ukpga/2012/7/contents

53 Robeznieks, A. Telehealth keeps patients connected to care. Now Congress must act. AMA. 27 December 2021. https://www.ama-assn.org/practice-management/digital/telehealth-keeps-patients-connected-care-now-congress-must-act

54 Equality and Human Rights Commission. A roadmap to race equality. 10 Oct 2017. https://www.equalityhumanrights.com/en/publication-download/roadmap-race-equality

55 OECD. Health for Everyone? Social Inequalities in Health and Health Systems. 27 September 2019. https://www.oecd.org/health/health-for-everyone-3c8385d0-en.htm

56 UCL Institute of Health Equity. Working for Health Equity: The Role of Health Professionals. March 2013. https://www.instituteofhealthequity.org/resources-reports/working-for-health-equity-the-role-of-health-professionals/working-for-health-equity-the-role-of-health-professionals-full-report.pdf

57 World Health Organization (WHO) Regional Office for Europe. Health workforce data and statistics. https://www.euro.who.int/en/health-topics/Health-systems/health-workforce/data-and-statistics

58 UCL Institute of Health Equity. Working for Health Equity: The Role of Health Professionals. March 2013. https://www.instituteofhealthequity.org/resources-reports/working-for-health-equity-the-role-of-health-professionals/working-for-health-equity-the-role-of-health-professionals-full-report.pdf

59 Smith, T. M. Treating the community as your patient. AMA. 9 September 2016. https://www.ama-assn.org/education/accelerating-change-medical-education/treating-community-your-patient

60 Equality and Human Rights Commission. A roadmap to race equality. 10 Oct 2017. https://www.equalityhumanrights.com/en/publication-download/roadmap-race-equality

61 UCL Institute of Health Equity. Working for Health Equity: The Role of Health Professionals. March 2013. https://www.instituteofhealthequity.org/resources-reports/working-for-health-equity-the-role-of-health-professionals/working-for-health-equity-the-role-of-health-professionals-full-report.pdf

62 Centers for Disease Control and Prevention (CDC). Pasos Adelante Program. 13 June 2018. https://www.cdc.gov/prc/study-findings/research-briefs/pasos-adelantes.htm

63 World Health Organization (WHO). Human Resources for Health Observer, 4: Exploring health workforce inequalities. August 2010. https://apps.who.int/iris/bitstream/handle/10665/44374/9789241599788_eng.pdf;jsessionid=A5EAAC165C7F330654BA87353354484C?sequence=1

64 UCL Institute of Health Equity. Working for Health Equity: The Role of Health Professionals. March 2013. https://www.instituteofhealthequity.org/resources-reports/working-for-health-equity-the-role-of-health-professionals/working-for-health-equity-the-role-of-health-professionals-full-report.pdf

65 Equality and Human Rights Commission. Inquiry into racial inequality in health and social care workplaces. 20 April 2021. https://www.equalityhumanrights.com/en/inquiries-and-investigations/inquiry-racial-inequality-health-and-social-care-workplaces

66 World Health Organization (WHO). Human Resources for Health Observer, 4: Exploring health workforce inequalities. August 2010. https://apps.who.int/iris/bitstream/handle/10665/44374/9789241599788_eng.pdf;jsessionid=A5EAAC165C7F330654BA87353354484C?sequence=1

Clinician of the Future

Conclusion

Elsevier Health: Supporting the Clinician of the Future

Throughout this global report, we have presented the views that clinicians around the world shared with us about their roles and the healthcare systems in which they work today, the trends and factors that are driving change, and the future they expect to encounter in 10 years' time.

Their views form a picture of possibility: of the potential of digital technology to transform healthcare, of greater collaboration within the care team, across healthcare and beyond, of patients empowered to take care of their own health, and of exciting opportunities to develop new skills.

But far from presenting a utopian future, clinicians were clear about many challenges they face now, and those they expect to see in the coming decade. By hearing their concerns, we can better understand the problems clinicians are likely to encounter in the future, and working together, we can direct efforts wherever possible to addressing them.

Taking action towards opportunity

Elsevier has played a role in healthcare by supporting clinicians for more than a century. Clinicians rely on our trusted, evidence-based content and clinical solutions to help improve patient outcomes. Elsevier Health's information, decision tools and analytics have evolved with the development of new technologies to ensure clinicians can make the most of cutting-edge solutions to benefit patient care.

In each chapter of this report, we have shared various actions that different stakeholders could take to unlock the opportunities the future holds for healthcare and clinicians. Many of the views that clinicians shared with us will help inform our work going forward

Improving health literacy

With access to trusted patient education materials, clinicians can enable patients to be more informed and empower them to manage their own health.

Supporting the move to digital with systems and infrastructure

Digital tools that support the patient–clinician partnership, reduce administrative burden that help build and maintain empathy in a virtual setting.

Clinical decision systems

Integration of the latest high-quality research with other data in a smart system that leverages artificial intelligence (AI) and enables clinicians to provide better patient outcomes.

Efficient, well-integrated systems (and the opportunity to master them)

With better integrated systems, clinicians could have less administrative burden and more time for patients and learning.

Preparing the future clinician

Educational resources to ensure that current and future healthcare professionals have the latest clinical knowledge, leadership and data science skills.

This is a dynamic picture; as trends develop, the future will evolve. We want to keep listening to clinicians, and we invite you to share your thoughts and input with us.

elsevier.com/connect/clinician-of-the-future

Follow Elsevier Connect on Twitter, Facebook and LinkedIn

Clinician of the Future

Methodology

Phase 1: Discovery

Interviews with expert clinicians

- 60 minute interviews
- n=23

Uncover trends, expectation of future state of clinician roles the results from this phase of the research were used to inform the quantitative design in the next phase.

Phase 2: Measurement

Clinician survey

- 15 minute online quantitative survey
- n=2,838 clinicians from around the world (111 markets)

Measure attitudes, and uncover the paradigm shifts expected to have maximum impact on the way healthcare is delivered. Results weighted to represent global clinician population.

Phase 3: Interpretation

Key opinion leader roundtables

- Three 2-3 hour virtual roundtables with leading experts
- N=15 from China, the UK and the USA

Gather reactions to the findings and provide expert points of view on the clinician of the future, and one roundtable with students around the world.

For this study, Elsevier and Ipsos collaborated through three phases of research, cumulatively leading to the explorations in this report. At each stage, we worked with clinicians to identify and discuss the current role of the clinician, the drivers of change and trends that are likely to affect the future. Together, these three phases of research, plus a literature review, resulted in possible futures we hope will inspire further thinking on the topic and support clinicians as we move into the future of healthcare. In this section, we will look at the methodology more closely.

A note on terminology

When we mention 'clinicians' we are referring to doctors and nurses in primary and secondary care. There was extensive discussion about who to interview and include in the survey to get a clear picture of trends and drivers of change. While doctors and nurses often have different experiences, they work together within the healthcare system and are key members of the care team. Taken together, their input helps provide a more comprehensive story. However, to ensure any significant variances are uncovered, in this report we have highlighted those meaningful differences that emerged from the survey, interviews and roundtables.

Phase 1:

Discovery interviews with expert clinicans

Literature review and extensive internal discussions between Elsevier and Ipsos teams established some key hypotheses as a basis for in-depth discussions with clinicians. Our research objectives for this phase were:

- To understand the day-to-day lives and frustrations of clinicians
- To explore their frustrations and how any unmet needs or challenges could be overcome, through infrastructural changes and/or the advent of technology
- To identify and explore any trends that clinicians expect to disrupt healthcare in the future
- To understand how these changes may impact clinicians' roles in practice

The interviewees

A list of potential interviewees were identified from various parties known to Elsevier, incorporating suggestions made by executives from The Lancet, who advised on the project and clinicians recruited directly from Ipsos' network (REACH[1] – Thought Leadership). Invitations to take part were based on people's experience or interest in digital and connected health technologies and the future of healthcare.

In total, 23 key opinion leaders, doctors and nurses took part in one-hour interviews. The names of those who participated and chose not to remain anonymous are listed in the acknowledgements section of this report. In return for their participation, the interviewees could select a charity to receive a $150 donation on their behalf.

This research aimed to establish a global picture of trends and drivers of change. In the initial phase, we interviewed clinicians from eight countries: US (n=7), UK (n=6), China (n=4), Spain (n=2), Italy (n=1), Nigeria (n=1), Iran (n=1) and India (n=1). Collectively, the interviewees covered the range of clinicians we wanted to address with this research, namely nurses and doctors in primary and secondary care.

The interviews

The aim of this phase was to capture initial trends and beliefs around the future of healthcare, which would inform the formulation of the questionnaire for phase 2.

Experienced healthcare moderators from Ipsos led the interviews between 24 August and 10 September 2021. Most of the interviews were conducted in English, and experts in China were interviewed in their native language.

Our initial hypotheses fed into the discussion guide used by the interviewers as a basis for the conversations. The moderators shared 'stimulus showcards' throughout the interviews, sharing examples of challenges and trends for the experts to comment on.

The interviews were recorded and transcribed, with permission this final report incorporates quotes from this phase of the research.

Phase 2:

Clinician survey

Together with the foundational input and hypotheses, the findings from the interviews formed the basis for the quantitative survey. Our aim with the survey was to uncover:

- Attitudes to the future of healthcare and the role of technology
- Awareness of current and future technologies and solutions
- Drivers likely to generate the most change
- Perceptions of the future role of the clinician

Ideas generated through the qualitative research on each theme were formulated as statements in each survey question, and response was measured using various Likert scales.

The result was a 15-minute online survey designed to measure current attitudes and top drivers of change in healthcare and the role of the clinician. There were five sections:

- **Introductory section** – an introduction to the research, consent steps and information about their current role.
- **Current state of healthcare** – respondents were asked about their agreement with statements such as 'I enjoy my job' and 'Healthcare information for patients need to be improved'. They also provided information about the number of hours they worked and whether (and why) they were considering leaving their roles.
- **Healthcare trends** – respondents were asked about trends they had noticed over the past 10 years, such as 'There is far more patient care taking place in the home' and 'Being technologically-savvy is more important in a clinician's daily role'. They were also asked how they felt the clinician's role has changed, and what may be contributing to that change.
- **Future of healthcare** – respondents were asked whether they agreed with statements about healthcare in the future, such as 'The majority of consultations between clinicians and patients will be remote' and 'The widespread use of Digital Health Technologies will enable positive transformation of healthcare'. They also shared what they believed to be the three most valuable skills for clinicians today and in 2031, and the support they need.
- Demographics – to understand who was responding we included a number of questions about the clinicians, such as their location, role and gender.

The respondents

Individuals invited to participate in the study were drawn from a number of sources, including:

- Clinicians who had published recently – these individuals were randomly selected from a database of published authors across 9,000 health titles (including journals and books) from various publishers
- Clinicians on a third-party panel provided by Dynadata (voluntary sign up)
- Users of Elsevier solutions aimed at doctors and nurses (including ClinicalKey)

Participants were recruited using an email invitation containing a link to the online survey. To qualify, participants had to be practicing as a doctor (resident/fellow/physician) or a nurse (midwife/nursing practitioner) or a physician assistant/associate at the time of fieldwork.

We invited 415,160 individuals to participate in the study between October and December 2021. 8,935 people clicked the link, 1,588 of those screened out and 4,509 quit during the survey. In total, 2,838 people responded, including n=1691 doctors, n=39 physician assistants, n=1108 nurses and midwives who chose to take part in the online survey between 21 October and 9 December 2021. A full breakdown can be found in the appendices.

Participants were recruited across n=118 countries (see Appendix 2). As participation in the survey was voluntary, the number of completes in each country varied (see Appendix 1). To achieve a global average that was reflective of the population of clinicians, the data was weighted by clinician and nurse representation, derived using OECD statistics, in three regions: Asia-Pacific (APAC), Europe, the Middle East and Africa (EMEA) and North America (NOAM) plus South America (SA) (RIM weighting efficiency = 77%). The following weighting was applied: APAC = 48%, EU and MEA = 32% and NOAM/SA = 20% plus an efficiency to ensure the total data included a ratio of 50:50 roles (doctor and nurse).

As the final sample of doctors was greater than that of nurses, the global sample was also equally weighted between doctors/assistants and nurses/midwives (RIM weighting efficiency = 93%). This was conducted so each clinical role has the exact same influence on the final combined data.

We applied two statistical tests with a confidence level of 95%:

1. Column Proportions Test
2. Column Means Test

Despite the weighting, the study is not without limitations due to self-selection, non-response biases and the lower response rate than what is typical for online surveys of this nature. Therefore, there will be some non-sampling error associated with this study, as we cannot be sure responses accurately represent the views of the population for a given country. Statistical differences shown in this report should be interpreted within this context, and while showing notable differences between groups, results are not necessarily generalizable to a whole country. Given the non-probability sampling methods, these tests are indicative.

Phase 3:

Virtual roundtables with key opinion leaders

Input from key opinion leaders was an essential component of this research – they are experts in their fields who have valuable insights and perspectives on trends and possible futures in healthcare.

Ipsos led three roundtable discussions with key opinion leaders in the three main markets: China, the USA and the UK. Using findings from the interviews and data from the quantitative survey, they guided the discussions to enable the participants to provide commentary on the insights and the future role of the clinician, including:

- The growing issue of clinician burnout and individuals contemplating leaving the industry
- The requirements for clinicians to be able to manage relationships in the era of the empowered patient
- The need to be computer literate and have a good understanding of data analytics in order to utilize new technology

Before each session, Ipsos shared briefing materials with the participants, including the initial findings from the qualitative and quantitative phases of the research. The moderators presented these findings at the start of each session, including data specific to the region They facilitated discussions with the whole group and in smaller breakout sessions. Using virtual workshopping tools, they captured themes and quotes. The roundtable sessions were recorded and transcribed for analysis. Quotes from the three key opinion leader roundtables have been included in this report.

The key opinion leaders

Thirteen key opinion leaders (KOLs) took part in three roundtables; participants were offered a $150 donation to a charity of their choice in return. In total, n=4 KOLs from China participated on 22 November 2021, n=4 KOLs from the UK participated on 7 December 2021, and n=5 KOLs from the USA participated on 12 January 2022.

Participants were recruited from databases supplied by Elsevier and The Lancet, in addition to clinicians recruited directly from Ipsos' network (REACH – Though Leadership) and identified based on their experience in the sector and their involvement in the future of healthcare.

The students

Ipsos led a global student roundtable with 12 participants to capture the voice of the next generation of clinicians (run on 15 February 2022). Participants were recruited from databases supplied by Elsevier

Compiling the findings

The team collated the results of the three research phases to form a clearer picture of the trends that are already playing out in healthcare, the drivers of change that are likely to have an impact, and the clinician of the future. The key findings from each phase of the research form the basis for this report.

References

1 REACH is a 501(c)(3) global social impact organization. The organization supports the role of public health professionals in influencing and shaping the conversations, they have a number of clinicians who are advancing medicine through the use of digital and connected health.

Acknowledgments

Clinician of the Future Program Participants:

Discovery interviews:

Dr Anna Peter, Senior Registrar at University of Maiduguri Teaching Hospital, Nigeria

Dr Caroline Chill, Clinical Director for Healthy Ageing at the Health Innovation Network, UK

Dr Eisa Houshmand, Nurse at KordKoy Amiralmomenin Hospital Golestan University of Medical Science, Iran

Dr Hany Atallah, Chief Medical Officer at Jackson Memorial Hospital, USA

Dr Ian Tong, Chief Medical Officer of Included Health, USA

Dr Luca Bertolaccini, Division of Thoracic Surgery, IEO European Institute of Oncology IRCCS, Italy

Maria San Jose Martin, Nursing leader, Spain

Dr Michael Lempel, Doctor at Ionva Medical Group, USA

Dr Mukul Roy, Senior Clinician at Jaslok Hospital, India

Dr Omar Ibrik, Senior Clinician at Hospital de Mollet Spain

Dr Paul Molloy, General Practitioner at Clarendon Medical Center, UK

Prof Pandiyan Natarajan, Senior Clinician, India and USA

In addition, we would like to extend our thanks to other interviewees including medical students who participated anonymously.

China roundtable:

Prof Ji Jiafu, President, Beijing Cancer Hospital and Beijing Institute for Cancer Research, China

Prof Liang Tao, Vice Dean of School of Nursing in Peking Union Medical College, China

Prof Liu Shiyuan, Director, Chinese Medical Association Radiology Committee, department chair of Radiology and Nuclear Medicine at Changzheng Hospital, China

Prof Xu Zhonghuang, President of Arion Cancer Center, China

UK roundtable:

Dr Charles Alessi, Chief Clinical Officer at HIMSS International / Senior Advisor UK Public Health, UK

Prof Gemma Stacey, Director of Academy, Florence Nightingale Foundation, UK

Dr Neil Paul, Lead GP and Principal Investigator, Sandbach GPs, UK

Dr Stan Shepherd, Chief Executive Officer, Instant Access Medical, UK

US roundtable:

Dr Anthony Chang, Chief Intelligence and Innovation Officer and Medical Director of the Heart Failure Program, Children's Hospital of Orange County, USA

Prof Jan Bakker, Clinical Professor, Department of Medicine at NYU Grossman School of Medicine, USA, and Professor of Intensive Care at Erasmus MC University Medical Center in Rotterdam, The Netherlands

Dr Leo Anthony Celi, Staff Physician, Division of Pulmonary, Critical Care and Sleep Medicine, Beth Israel Deaconess Medical Center, USA

Dr Marion Broome PhD RN, FAAN, Ruby F. Wilson Professor of Nursing at the School of Nursing, Duke University, USA

Dr Suzanne Miyamoto, Chief Executive Officer of the American Academy of Nursing, USA

Reach Faculty "future of health" roundtable:

Dr Hemalee Patel, Senior Medical Director of Chronic Care Management at One Medical, USA

Clinician of the Future student roundtable:

Aakanksha Singh, India
Amanda Graham, Trinidad & Tobago
Delia Mercedes Bianco, Italy
Femke Roelofs, The Netherlands
Ishaan Wazir, India
Jill Kar, Georgia
Maria Ahmad, UK
May Elsayed, Egypt
Oroshay Kaiwan, USA
Paraskevi Samouti, Cyprus
Rehab E. Ashmawy, Egypt
Samah Ahmed, Canada

Acknowledgments

Sponsor

Jan Herzhoff
Elsevier

Program Directors

Adrian Mulligan
Terri Mueller
Elsevier

Program Team

Chris West
Maria Aguilar
Elsevier

Amy Ye
Cassie Gardener
Fiona Thomas
Frances Salt
Gursimran Kaur
Reena Sooch
IPSOS

Report Authors

Lucy Goodchild (lead author)
TellLucy.com
Adrian Mulligan
Elizabeth Shearing Green
Terri Mueller

Report Communications

Alice Hunt
Terri Mueller
Chris West
Ian Evans

Thanks also to various Elsevier staff who provided valuable support on this report.

Communications Consultants

Christina Corso
Elizabeth Shearing Green
Ben Taylor
Kerry Harrington
Sam Coldicutt
Ty Guzman-Touchberry
WE Communications

Report Design

David Rickels
Daniel Sullivan
DR Design Associates

Appendix 1

Sample bases for reporting groups

Total (n=2838)
Asia Pacific (n=842)
Mid. East & Africa (n=128)
North America (n=445)
South America (n=168)
China (n=499)
Germany (n=162)
France (n=82)
India (n=161)
Japan (n=63)
Spain (n=239)
UK (n=604)
USA (n=434)
Europe (n=1255)

Role by market: Doctor (n=1691)
Asia Pacific (n=433)
Europe (n=755)
Mid. East & Africa (n=105)
North America (n=268)
South America (n=130)
China (n=209)
Germany (n=69)
India (n=69)
Japan (n=61)
Spain(n=130)
UK (n=411)
USA (n=261)

Role by market: Nurses (n=1108)
Asia Pacific (n=408)
EUROPE (n=481)
North America (n=168)
South America (n=30)
China (n=289)
France (n=55)
Germany (n=86)
India (n=92)
Spain (n=106)
UK (n=190)
USA (n=164)

Appendix 2

Sample bases responses by country

ASIA-PACIFIC

Country	Base
Australia	46
Bangladesh	3
China	499
Hong Kong	1
India	161
Indonesia	5
Japan	63
Malaysia	2
Nepal	7
New Zealand	11
Pakistan	22
Philippines	9
Singapore	3
South Korea	1
Sri Lanka	3
Taiwan	3
Thailand	1
Vietnam	2

EUROPE

Country	Base
Albania	2
Austria	20
Azerbaijan	1
Belarus	1
Belgium	3
Bulgaria	1
Croatia	5
Cyrpus	1
Czech Republic	3
Denmark	1
Faroe Islands	1
France	82
Germany	162
Greece	4
Hungary	1
Ireland	6
Italy	43
Kosovo	1
Latvia	1
Lithuania	2
Malta	1
Moldova	1
Netherlands	3
Norway	1
Poland	3
Portugal	8
Romania	2
Russia	25
Slovakia	1
Slovenia	2
Spain	239
Sweden	1
Switzerland	16
UK	604
Ukraine	7

MIDDLE EAST & AFRICA

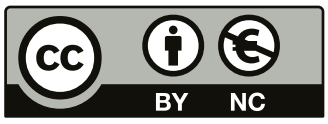
Country	Base
Algeria	2
Bahrain	2
Benin	1
Democratic Republic of Congo	3
Egypt	17
Ethiopia	3
Georgia	1
Ghana	2
Iran	13
Iraq	5
Israel	4
Ivory Coast	1
Jordon	2
Kenya	9
Kyrgyzstan	1
Lebanon	3
Madagascar	1
Malawi	1
Mali	1
Mauritius	1
Morocco	4
Nigeria	2
Oman	2
Qatar	1
Saudi Arabia	2
South Africa	8
Syria	1
Tanzania	1
Togo	1
Tunisia	2
Turkey	23
Uganda	4
United Arab Emirates	3
Zambia	1

NORTH AMERICA

Country	Base
Canada	11
US	434

SOUTH AMERICA

Country	Base
Argentina	28
Barbados	1
Bolivia	2
Brazil	41
Chile	5
Colombia	14
Costa Rica	1
Cuba	4
Ecuador	4
El Salvador	1
Guatemala	3
Honduras	1
Mexico	50
Panama	3
Paraguay	2
Peru	4
Puerto Rico	1
Uruguay	2
Venezuela	1



Health

Elsevier March 2022