Clinician of the Future 2023

Elevating global voices in healthcare

Clinician of the Future 2023

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Clinician of the Future 2023

Foreword

The future of health is being profoundly shaped by a convergence of key factors that are redefining how we approach healthcare on a global scale. First and foremost, advancements in medical technology are driving unprecedented innovations, allowing for more accurate diagnoses, personalized treatments, and enhanced patient outcomes. Cutting-edge technologies such as artificial intelligence, genomics, telemedicine, and wearable devices are revolutionizing patient care by enabling healthcare professionals to make data-driven decisions and tailor interventions to individual needs. Additionally, the increasing emphasis on preventive healthcare is reshaping the landscape, with a shift towards proactive measures aimed at identifying and addressing health risks before they escalate into more serious conditions. This preventive approach, coupled with greater patient empowerment through health education and awareness, is fostering a new era of self-managed wellness.

Last year, we launched the Clinician of the Future report to explore emerging trends shaping the future of healthcare and elevate the voices of thousands of clinicians around the world on the opportunities and challenges they are facing in their roles. Since the world we're living in is changing rapidly, we're pleased to share with you the latest findings and insights from the Clinician of the Future 2023 report. In this report, you will learn more about key priorities for the future of health, including clinicians' concerns on the ongoing nursing and doctor shortage, their interest and apprehension on the fast-moving world of artificial intelligence, their views on improving the continuous training of clinicians, and perspectives on the integration of scientific research in clinical practice.

At Elsevier Health we support current and future healthcare professionals by providing trusted, evidence-based content and data analytics to help inform clinical decisions. As part of our company mission, we are committed to identifying and providing solutions to address the changing healthcare landscape today and tomorrow and will continue to listen and amplify the voices of those on the frontlines of patient care.

I hope you enjoy reading this report and if you're interested in learning more about upcoming Clinician of the Future reports and events, please sign up to be a part of the Clinician of the Future community.

Sincerely,

Jan Herzhoff

President, Elsevier Health

Clinician of the Future 2023

Summary

Today's clinicians are enthusiastic about their roles, but many are acutely aware of the challenges facing healthcare, including staff shortages. They are keen to balance this and can see the potential of technological solutions, including artificial intelligence (AI), to ease their work burden.

These are all drivers of change, helping shape tomorrow's healthcare landscape – one in which the clinician of the future will work. Elsevier Health developed the inaugural Clinician of the Future report in 2022; this 2023 survey explores the latest trends in clinicians' perspectives.

This new report takes a snapshot of clinician behavior and opinion that shows progress – or not – toward the possible futures we envisioned in the *Clinician of the Future Report 2022*. Through an online survey; 2,607 clinicians around the world shared their experiences and views. This report focuses on four themes that emerged strongly from the results.

Clinicians are seeking balance

For details, see Chapter 1 on page 8

Clinicians enjoy their work, but more are considering leaving their roles (37%) than in 2022 (33%), and 13% are considering leaving healthcare altogether, with many (9%) retiring. Clinician shortage is a concern, particularly in the UK and the USA, and many are worried that newly qualified doctors did not get enough hands-on training due to COVID-19. Digital technology, including artificial intelligence (AI), could be part of the solution as we move toward the Future Balanced Clinician envisioned in the *Clinician of the Future Report 2022.*

➤ 86% enjoy their jobs but they continue to work long hours

➤ 49 hours is the average working week

➤ 37% are considering leaving their jobs in the next 2-3 years

➤ 13% are considering leaving healthcare in the next 2-3 years

➤ 54% rate tackling the shortage of nurses as a top priority

Technology and AI are empowering clinicians

For details, see Chapter 2 on page 19

The dependency on technology has always been high among clinicians but the appetite for it as an enabling tool is increasing, as it is perceived to help address time pressures, create efficiencies and enhance clinical practice. There is an appetite to use generative AI tools to learn and inform their decision making, and a growing desire among clinicians to have digital technology expertise, especially as they anticipate using patient-collected data to help make decisions. The Future Tech-Savvy Clinician is closer than clinicians may have imagined: many of their predictions for healthcare a decade in the future now seem to be on the 2-3 year horizon. This includes using generative AI tools, though there are differences of opinion and debate around future use of AI.

➤ 48% find it desirable for physicians to use AI in clinical decision making

➤ 11% of clinical decisions are currently assisted by generative AI tools

➤ 51% consider AI desirable for training doctors, 50% for training nurses

➤ 73% consider it desirable for doctors to be digital experts, and 71% for nurses

➤ 68% find it desirable that patient-collected data informs clinical decisions

Knowledge and technology are transforming the clinician–patient relationship

There is a trend towards patient empowerment, with clinicians expecting their health literacy, knowledge of social determinants of health (SDOH) and proactive health management to grow in the coming five years. As the use of digital technologies (e.g. wearables) increases and interactions become more virtual, clinicians may need to upskill. This progress toward the Future Partner for Health that we envisioned in the *Clinician of the Future Report 2022* will be supported by developments in digital technology. Clinicians think that:

➤ Two in five (41%) patients are health literate today

➤ Half (49%) of patients will be health literate in 2028

➤ Knowledge of SDOH: 35% today ➔ 48% in 5 years

➤ Active management of health: 38% today ➔ 49% in 5 years

➤ Use of monitoring tools: 27% today ➔ 45% in 5 years

➤ 55% find telehealth desirable as the main mechanism for routine check-ups

➤ 61% of clinicians have enough time to provide good patient care

Clinicians imagine a value-based future

Overall, clinicians have a positive sentiment toward value-based care, with most expecting it to reduce burden on secondary care and improve the patient experience while saving costs. They recognize the importance of moving to a preventive and personalized approach, noting there is still a journey ahead, including improving preventive care. Although value-based care is not yet a broad reality in most countries, some are moving towards it, and clinicians generally see this positively.

➤ 74% of clinicians think more should be done in preventive care

➤ 73% of clinicians expect that most patients will be managed in primary care settings

➤ 69% of clinicians expect hospital stays to be shorter

➤ 67% expect institutions to monitor patients' social determinants of health

➤ 51% of clinicians expect value-based care to lower costs

➤ 40% of clinicians consider personalized treatment approaches a top priority

This is a dynamic picture, and as new clinicians enter the workforce, the landscape will continue to shift. We conducted this 2023 survey to keep listening to clinicians, and we're not stopping here. Our next step on this journey is a survey of students on AI and a number of other topics.

We invite you to share your thoughts and input with us. With these insights, we can continue to develop solutions that help clinicians and their communities.

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Introduction

Healthcare continues to change, and we're taking its pulse

In the *Clinician of the Future Report 2022,* we looked at the future clinician from five angles, and identified the different skills, profiles, and roles that could meet the challenges clinicians identified ahead. We established a baseline by asking clinicians about their current experience, and we asked them to look a decade ahead to build a picture of what might be coming.

One year on, we have taken a pulse of the evolving world of healthcare. We have followed up on some previous findings, looked from different angles at others, and opened new lines of investigation. In this report, you can read the results and find out how the landscape is shifting.

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

The Clinician of the Future

Looking at the clinician of the future from five angles highlights how multifaceted their work is, today and in the future. It also shows the multiple challenges clinicians face, and the range of solutions they will need access to in order to navigate the world of healthcare tomorrow.

The Future Clinician as a Partner for Health will work collaboratively with patients, who are informed, empowered members of their own care team.

The Future "Total Health" Clinician will help people stay healthy rather than waiting until they become ill, by focusing on preventive healthcare.

The Future Tech-Savvy Clinician will improve patient outcomes by using data and the latest digital health technologies, which are constantly evolving.

The Future Balanced Clinician will have a better work–life balance if staff shortages are addressed, helping avoid the burnout prevalent today.

The Future Accessible Clinician is aware of health inequities and works in a system that makes care more available to diverse populations.

In this report, we have the future clinician in mind, and we refer to these five perspectives within the four main trends that came through in the latest survey.

Clinician of the Future 2023

In this study, our objective was to take the pulse of attitudes and perceptions among healthcare professionals, to see where we stand one year on. The aim was to uncover shifts in expectations that could impact the way healthcare is delivered in the future and consider what clinicians might do as those changes progress.

Clinician survey
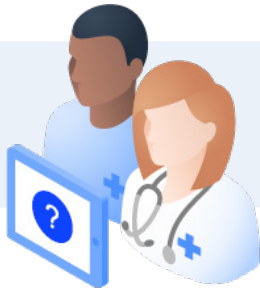
10-15-minute
online survey

n=2,607 clinicians
from 116 countries

April and May 2023

See the Methodology (page 52) and Appendix (page 54) for a more detailed breakdown.

The world today is quite different to the one in which we captured clinicians' views for the inaugural Clinician of the Future report: in late 2021, many countries were experiencing ongoing measures to deal with the COVID-19 pandemic. Although still affecting many people, the COVID-19 pandemic has further abated, and we have increasingly adjusted to a new post-pandemic life. Some of the changes the pandemic brought in have remained permanent, notably the rise of telehealth.

One of the biggest shifts we have seen in the healthcare sector in the last year has been the emergence and rapid growth of AI, particularly generative AI tools like ChatGPT and Bard. To ensure we have a representative picture of clinicians' experience today and expectations of the future, we have asked a number of questions about their attitudes to AI.

Alongside the survey results, we have explored aspects of today's healthcare landscape, putting a spotlight on three markets: China, the UK and the USA. Each country and region has its own context, and this has an influence on clinicians' responses. While we have tried to interpret responses within context, we are taking an objective view of the survey data. We share the results in the text and highlight some in visuals; you can explore the full results at beta.elsevier.com/clinician-of-the-future.

This 2023 report takes a snapshot of clinician behavior and opinion that shows progress – or not – toward the possible futures we envisioned in the 2022 report. By continuing to elevate the voices of clinicians, we can better understand the challenges they expect to face in the years ahead and consider how all healthcare stakeholders can partner with doctors and nurses to support them in providing the best care possible for their patients.

Clinician of the Future 2023

Clinicians are seeking balance

Chapter 1

Health | Clinician of the Future

Clinicians are seeking balance

➤ 86% enjoy their jobs but they continue to work long hours

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➤ 37% are considering leaving their jobs in the next 2-3 years

➤ 13% are considering leaving healthcare in the next 2-3 years

➤ 54% rate tackling the shortage of nurses as a top priority

Clinicians enjoy their work, but more are considering leaving their roles (37%) than in 2022 (33%), and 13% are considering leaving healthcare altogether, with many (9%) retiring. Clinician shortage is a concern across most markets, particularly in the UK and the USA, and many are worried that newly qualified doctors did not get enough hands-on training due to COVID-19. Digital technology, including artificial intelligence (AI), could be part of the solution as we move toward the Future Balanced Clinician envisioned in the *Clinician of the Future Report 2022*.

In the 2022 Clinician of the Future survey, clinicians shared that they love what they do. Despite experiencing the COVID-19 pandemic and facing a range of challenges and frustrations, clinicians are enthusiastic about their jobs. The Clinician of the Future 2023 survey shows that the vast majority of clinicians still enjoy their jobs: 86% of clinicians globally agreed, the same level of agreement as the 2022 survey.

Most clinicians enjoy their roles

Agreement is high across different regions; it is highest in South America, where 94% of clinicians reported enjoying their jobs (95% of doctors and 93% of nurses).

Although most respondents agree, there was a significant drop in job enjoyment since the previous study in China, where 86% of doctors and nurses enjoy their jobs, down from 91% and 90% respectively in 2022.

Job enjoyment is significantly lower among doctors in the USA (80%) and the UK (76%). Given the backdrop of overstretched healthcare systems, with widespread striking in the USA[1] and UK,[2] clinicians have had a challenging year.

In the *Clinician of the Future Report 2022*, we saw a picture of clinicians around the world burning out due to pressure from the COVID-19 pandemic, coupled with feeling undervalued. Although the height of the COVID-19 pandemic is now further behind us, clinicians are still feeling the pressure.

According to the Physicians Foundation's 2022 Survey of America's Physicians, capacity issues mean one-third of physicians are overextended and overworked today, and nearly half are at maximum capacity.[3] Almost half of respondents do not have high professional morale, and more than half lack positive feelings about the profession.
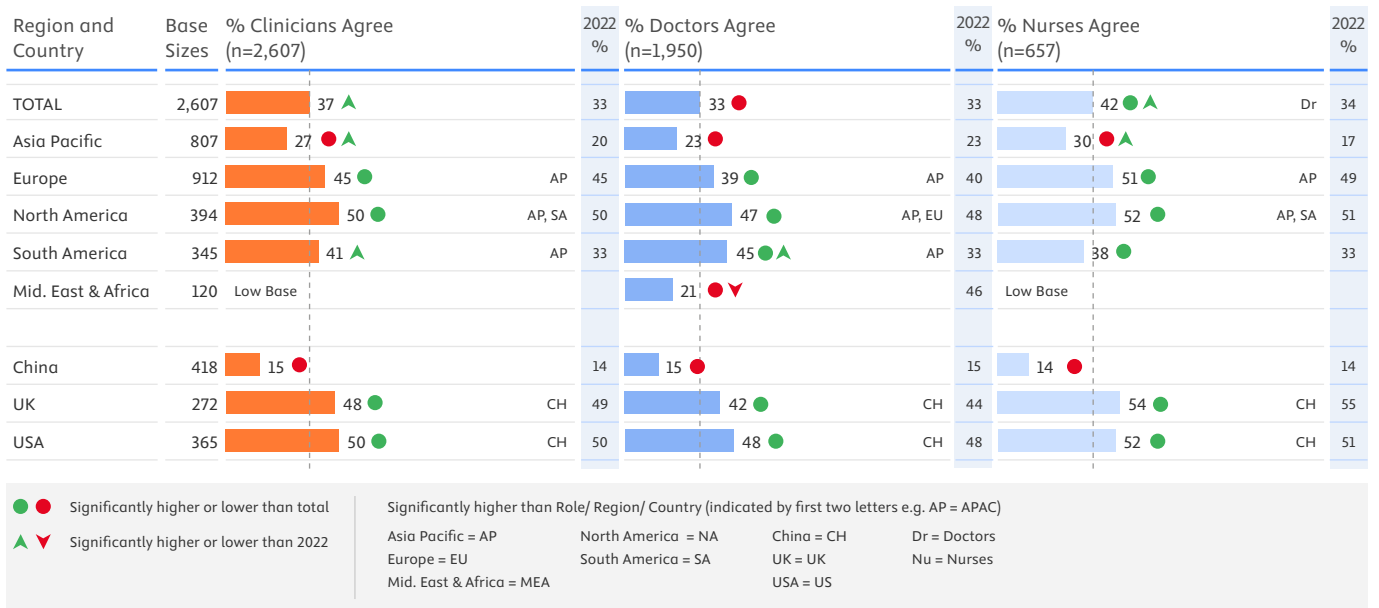
The result? Half of respondents would not recommend a career in medicine. Similarly, research published in Mayo Clinic Proceedings showed that in the wake of the COVID-19 pandemic, "only 57% of doctors would choose medicine again." [4]

Many clinicians are considering leaving healthcare in the near future

In this year's survey, we have seen an increase in the percentage of respondents considering leaving their roles in the next 2-3 years, with 37% considering this in 2023; the comparable figure was 33% in 2022. The increase since last year is being driven by more nurses considering leaving (increasing from 34% to 42%), with the proportion of doctors remaining at 33%.

Europe (51%) and North America (52%) have the highest rates of nurses considering leaving, both significantly higher than the global average. It is similar for doctors in both regions (39% and 47% respectively). The largest shift among nurses since last year is in Asia Pacific (from 17% to 30% in 2023). The proportion considering leaving their roles is highest for nurses in the UK (54%).

Statement: I am considering leaving my current role within the next 2-3 years

Region and Country	Base Sizes	% Clinicians Agree (n=2,607)		2022 %	% Doctors Agree (n=1,950)		2022 %	% Nurses Agree (n=657)		2022 %
TOTAL	2,607	37 ▲		33	33 ●		33	42 ●▲	Dr	34
Asia Pacific	807	27 ●▲		20	23 ●		23	30 ●▲	AP	17
Europe	912	45 ●	AP	45	39 ●	AP	40	51 ●	AP	49
North America	394	50 ●	AP, SA	50	47 ●	AP, EU	48	52 ●	AP, SA	51
South America	345	41 ▲	AP	33	45 ●▲	AP	33	38 ●		33
Mid. East & Africa	120	Low Base			21 ●▼		46	Low Base		
China	418	15 ●		14	15 ●		15	14 ●		14
UK	272	48 ●	CH	49	42 ●	CH	44	54 ●	CH	55
USA	365	50 ●	CH	50	48 ●	CH	48	52 ●	CH	51

● ● Significantly higher or lower than total

▲ ▼ Significantly higher or lower than 2022

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP	North America = NA	China = CH	Dr = Doctors
Europe = EU	South America = SA	UK = UK	Nu = Nurses
Mid. East & Africa = MEA		USA = US	

Question: B1. 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.

We also asked survey participants what they are most likely to do next. Of the 37% considering leaving their roles, 24% plan to move to another role in healthcare, and 13% plan to leave healthcare altogether, either by moving to a non-healthcare-related job or retiring. (Please see the full research analysis accompanying this report for more detail.)

Again, there are significant regional differences. In North America, where 50% of respondents are considering leaving their jobs, almost half of them (24%) are planning to leave healthcare or retire. Similarly in the UK, 48% are considering leaving their jobs and 24% plan to leave healthcare or retire.

At the other end of the spectrum, clinicians in APAC are much more likely than those in other regions to remain in healthcare, with only 5% saying they plan to leave.

Looking at the differences between roles, nurses are much more likely to be considering leaving their roles and leaving healthcare: 33% of doctors may leave their roles, but only 11% plan to leave healthcare or retire. This is significantly higher for nurses, with 42% considering leaving their roles and 16% planning to leave healthcare or retire. (You can find more detail in the full research analysis accompanying this report.)

Notably, 30% of nurses in the UK and 25% of nurses in the USA are considering leaving healthcare altogether in the near future.

Retirement, promotion or frustration: why are clinicians planning to leave?

There are many reasons for leaving a role, and in the case of clinicians looking to move within healthcare, they could be pursuing the next step on their career ladder.

For those who are considering leaving healthcare, the growing frustration with systems under pressure could be having an impact. A 2023 study conducted in China revealed that less than half of the medical staff studied expressed job satisfaction, pointing to salary and benefits as a major contributing factor.[5] According to the National Governors Association, almost 20% of the US healthcare workforce left their jobs at the start of the pandemic, and another 20% were considering doing the same in the subsequent months.[6]

There's a similar picture in the UK, where GPs are most likely to plan to stop seeing patients in the near future, according to the Commonwealth Fund's 2022

International Health Policy Survey of Primary Care Physicians.[7] The survey linked this directly to stress: 35% of the doctors who were extremely or very stressed planned to stop seeing patients, compared to 23% of those who found their jobs less stressful.

This is indicative of a broader picture of job mobility. In the cross-sector 'Hopes and Fears' survey of 54,000 employees in 46 countries, PwC found that 26% of people expected to change jobs within a year – an increase from 19% in 2022.[8]

We also know that many clinicians are planning to retire. In the USA, more than a quarter of doctors are older than 60, and the average age of a nurse is 50.[9] In the Commonwealth Fund survey, doctors aged over 55 were more likely (67%) to plan to stop seeing patients regularly compared to those aged under 35 (15%).[10]

Statement: I am considering leaving my current role within the next 2-3 years
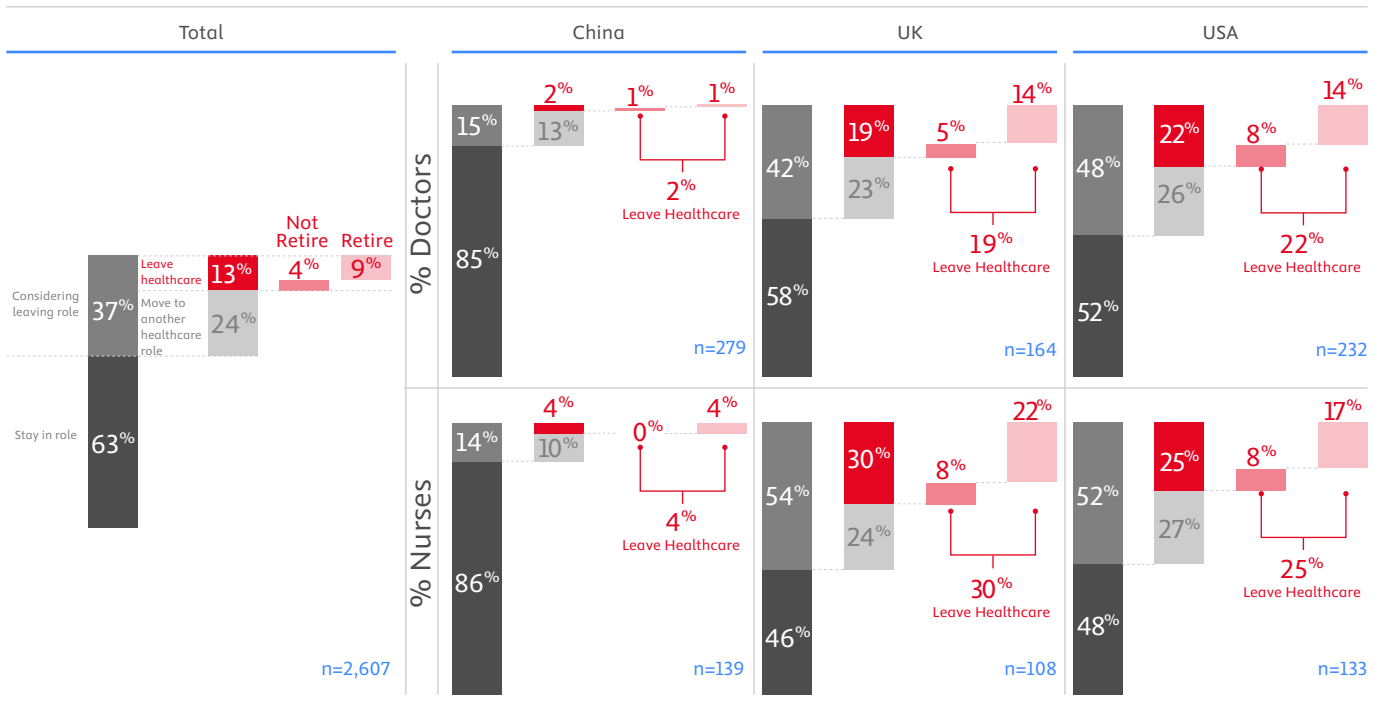
Question: B1. To what extent do you agree or disagree with each of the following statements with regards to healthcare? Please think about your current experience working in healthcare.

The Physicians Foundation research echoed this: among the 21% of doctors who want to retire in the next year, 30% were aged 46 and over, compared to 12% aged up to 45.[11]

And in the UK, the BMJ reported that the number of doctors choosing to retire early has increased by 9.3% a year on average, from 376 in 2008 to 1,424 in 2023.[12] In total, the number of doctors has grown from 2,431 in 2008 to 3,277 in 2023 – a rise of 35% in 15 years.

> "Whether through reduced hours or retirement, the loss of expertise of our most senior doctors—whether in hospitals or GP practices—is a huge loss for patients, colleagues, and the future of the NHS."
>
> — Vishal Sharma, chair of the BMA Consultants Committee and pensions committee, talking to the BMJ.[12]

A positive shift in the clinician's daily role

In the *Clinician of the Future Report 2022*, we identified adjusting roles as a driver of change: many clinicians felt their roles had worsened over the previous 5 to 10 years. However, overall, the 2023 survey reveals a slightly positive shift in the way clinicians see their daily roles and responsibilities.

Clinicians have registered a move toward preventive care; 74% of clinicians think there is not enough being done on preventative care in 2023, an improvement on 80% who thought this in 2022.

Clinicians are also overwhelmingly confident in the sources of information they are using to make clinical decisions, at 89% of clinicians feeling confident globally. This is significantly higher among doctors in the Middle East and Africa (95%), and nurses in the UK (94%) and UK clinicians overall (94%).

More clinicians have sufficient time to provide good patient care

Globally, 61% of clinicians say they have enough time to provide good patient care, up from the comparable figure of 52% in 2022. It is worth noting that the 2022 findings were based on a survey conducted closer to the height of the COVID-19 pandemic, when clinicians were focused on managing the pandemic, overstretched and likely to have a limited amount of time spend with individual patients.

Looking at their roles today more broadly, clinicians globally reported spending almost two-thirds (65%) of their time directly caring for patients, with 19% of their time spent on indirect patient care and 16% on non-care-related tasks.

The proportion of time spent on direct care is lower in Europe (58%) and South America (56%). Across the remaining regions, clinicians spent more time on direct patient care. This is significantly higher than the global average in North America (69%), particularly among doctors (72%), and in Asia Pacific (70%), particularly among nurses (75%). At 69% and 68%, USA and UK clinicians spend more time than average directly caring for patients. And in China, nurses report spending 90% of their time on direct patient care.

> In Europe and South America, clinicians spend about one-fifth of their time (18% and 21% respectively) on tasks not involving patient care. There is potential for digital technology to reduce this.

Clinicians' work-balance improves but remains a challenge

In the *Clinician of the Future Report 2022*, we saw clinicians often feeling overworked, overwhelmed and burned out. The full-time employed clinicians surveyed worked 50 hours on average in a typical week, and only 57% agreed they had a good work–life balance.

This has improved in the last year, with 63% of clinicians now agreeing they have a good work–life balance. The groups reporting the best work–life balance are nurses in China (79%) and nurses in the USA (75%). Work–life balance remains a greater challenge in Europe, where just over half (51%) of clinicians agree their balance is good; 49% of doctors and 53% of nurses agreed.

Looking at hours worked for those working full-time, there has been a decrease in the average, now at 49 hours – one hour less than in the 2022 report. The average working hours are a little higher in Asia Pacific, at 50 hours (though this is a reduction compared to 52 last year). Doctors work longer hours than nurses, at 52 hours for doctors and 42 hours for nurses globally, and doctors consistently worked longer across all regions.

Although this suggests a slight positive step forward for clinicians over the last year, zooming out to the broader evidence base, clinicians have been struggling – especially in the UK and USA. In a 2022 CHG Healthcare survey of over 500 physicians, 43% changed jobs, 8% retired and 3% left healthcare during the pandemic.[13] In line with our current Clinician of the Future survey, 13% of CHG respondents plan to leave healthcare in the near future. Their biggest reason for doctors making a career change is wanting a better work–life balance.

Similarly, McKinsey reports that 20-38% of nurses in the USA, the UK, Singapore, Japan, France, and Australia said they were likely to leave their current role in direct patient care in the next year.[14] Their reasons for leaving included the pandemic and salary, and reasons to stay included engagement with meaningful work.

Clinician shortages: a major priority

In 2022, the Clinician of the Future survey showed that most clinicians expected staff shortages, with 74% of clinicians agreeing there will be a shortage of nurses and 68% that there will be a shortage of doctors.

> "Nurse shortages and overall staff shortages are the normal now. Most are retiring within the next 10 years and new graduates seem to not have the drive."
>
> — Nurse (USA), 2023 survey

Clinicians' priority concern is needing more colleagues

Those shortages are now having a significant impact on clinicians in many regions, and as a result, this is number one concern globally. The shortage of nurses ranks #1 (54% selected it as a top priority) on the list of priorities for the next 2-3 years and the shortage of doctors ranks #5 (45%).

Statement: Tackling the shortage of nurses

Region and Country	Base Sizes	% Clinicians Select as a Top Priority (n=2,607)		% Doctors Select as a Top Priority (n=1,950)		% Nurses Select as a Top Priority (n=657)	
TOTAL	2,607	54		39		70 ● Dr	
Asia Pacific	807	41		28	SA	55	MEA
Europe	912	75 ●	AP, SA	58 ●	AP, SA	92 ●	AP, NA, SA
North America	934	69 ●	AP, SA	61 ●	AP, SA	78 ●	AP, SA
South America	345	43		22		65	
Mid. East & Africa	120	Low Base		34	SA	Low Base	
China	418	36 ●		18		51	
UK	272	78 ●	CH	63 ●	CH	93 ●	CH, US
USA	365	70 ●	CH, US	59 ●	CH	77	CH

● ● Significantly higher or lower than total   Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP	North America = NA	China = CH	Dr = Doctors
Europe = EU	South America = SA	UK = UK	Nu = Nurses
Mid. East & Africa = MEA		USA = US	

Question: D1. Thinking about your expectations of where healthcare should be in the next two to three years, what are the top 5 priority areas to be addressed?

Nurse shortages are a concern for most clinicians (54%) globally, but significantly more nurses (70%) than doctors (39%) are saying this is a top priority.

There are significant differences between regions too. In Europe and North America, nurse shortages are a bigger concern for clinicians, at 75% and 69% respectively. Again, significantly more nurses say nurse shortages are a priority, at 92% (Europe) and 78% (North America).

However, there is relatively little priority given to nurse shortages in China, with 36% of clinicians ranking it as top priority issue. About half (51%) of nurses in China say tackling nurse shortages is a priority, compared to just 18% of doctors.

> "The drop in nursing staff compared to the increase in population will be a major problem in the next 20 years."
>
> — Doctor (France), 2023 survey

> "The nursing shortage will continue to be a crucial problem unless educational programs increase enrolment."
>
> — Nurse (USA), 2023 survey

We see a similar pattern for prioritizing the shortage of doctors. Globally, 45% of clinicians say tackling the shortage of doctors is a priority issue for the next 2-3 years, with more doctors (48%) than nurses (42%) saying this. Fewer clinicians in Asia Pacific report this as a priority (35%).

However, at 68%, more clinicians in Europe prioritize this issue, again with more doctors (72%) than nurses (64%) agreeing. This is influenced by significantly higher agreement in the UK, where 78% of clinicians (81% of doctors and 74% of nurses) agree the shortage of doctors should be prioritized.

93% of nurses in the UK and 77% of nurses in the USA say tackling nurse shortages should be a priority.

As organizations address shortages, it will be important to consider representation. In the *Clinician of the Future Report 2022*, 63% of clinicians said they expect the healthcare workforce will be more diverse in the future to better represent the local population. Agreement is highest in Asia Pacific (75%), particularly in China (81%).

Clinicians want greater diversity in the healthcare workforce

With ongoing inequities in the healthcare workforce and the impact that might have on patient care, this is a priority for many clinicians. A quarter (24%) of respondents to the 2023 survey consider encouraging greater diversity in the healthcare workforce to better represent the local population a priority in the next 2-3 years. Echoing expectations of the previous year, this is highest in Asia Pacific (30%), particularly among doctors in China (34%). You can explore priorities further in the accompanying full results released with this report.

What's behind the clinician shortages?

We need more healthcare workers globally to work with our aging and growing population, which is estimated to reach 9.7 billion in 2050. Yet in many countries, we are seeing negative trends. For example, according to WHO statistics, in the USA, there were almost 1 million fewer nurses in 2020 (4.19 million) than there were in 2018 (5.13 million).[15] And in the UK, the number of GPs has fallen since 2015, with the shortage anticipated to grow to 8,800 by 2031, accounting for one vacancy in every four positions.[16]

Predictions for clinician shortages vary. Deloitte estimates that we will need 80 million more healthcare workers globally by 2030 to meet the need for 23 skilled health professionals per 10,000 people.[17]

The WHO estimates we will be short 10 million health workers in the same timeframe.[18]

In the USA, McKinsey estimates a nursing shortage of 200,000 to 450,000 (10-20%) by 2025,[19] and according to Association of American Medical Colleges (AAMC) projections, there will be a shortage of between 37,800 and 124,000 physicians by 2034.[20] Although unemployment in the sector fell over the last year from 803,000 in June 2022 to 733,000 in June 2023, and jobs are being added rapidly, the pressure is still on.[21]

According to the AAMC, if healthcare access were equitable across race, health insurance coverage, and geographic location today, the USA would need 180,400 more physicians.[22]

According to NHS workforce projections, the gap of 103,000 clinicians in 2021/22 will rise to about 179,000 by 2024/25 and settle at 156,000 in 2030/31, leaving the workforce 9% short.[23] With the policies currently in place, the NHS might have a shortage of 36,700 nurses in 2030/31.

And despite less concern about shortages in China, there has been evidence of shortages during the COVID-19 pandemic.[24] For example, in one report, clinicians in Beijing had to work while infected, as up to 80% of staff had the virus.[25]

"Physician shortages, already projected to be severe before COVID-19, have almost become a public health emergency."

— Dr. Gerald E. Harmon, past president of AMA, speaking at the unveiling of an AMA recovery plan in June 2023.[26]

Lack of control in an unprepared health system

As a result of the shortages, clinicians might be feeling the impact of bigger administrative burden, and insufficient compensation and benefits, as evidenced by the Physicians Foundation's 2022 survey.[27] They are also concerned about other aspects of healthcare that are out of their control: namely, the system's inability to cope in extreme events and the insufficient practice-readiness of new clinicians.

Many clinicians feel they're working in an unprepared environment

In the 2023 Clinician of the Future survey, globally, 60% of clinicians say their institutions are prepared for health emergencies, with doctors (55%) less likely than nurses (64%) to perceive preparedness.

Clinicians in South America (36%) and Europe (43%) are least likely to believe their institutions are prepared for health emergencies. Agreement is also low among doctors in the UK (43%) and UK clinicians overall (51%). In contrast, agreement is significantly higher in the USA (69%) and highest in China (75%), with 83% of nurses in China agreeing their institutions are prepared for emergency.

Less than half of employers have sustainability and environmental targets

Globally, 45% of clinicians agree that their institution had set environmental sustainability targets. Agreement is significantly lower in South America (32%), North America (36%) and Europe (39%). Clinicians in Asia Pacific are significantly more likely to agree (55%) with agreement highest in China (58%).

There is evidence of this around the world – even in environments where there are fewer targets, institutions are laying the groundwork for environmental sustainability. For example, in the UK, the NHS has set itself the target of becoming the world's first net carbon zero health service through the Greener NHS programme.[28]

This reflects institutions' concern for broader issues, which may also be indicative of other dimensions of sustainability, including social aspects such as employee engagement.

Newly trained clinicians are perceived to be unprepared for clinical practice

Most clinicians globally (67%) believe their newly trained colleagues lack hands-on training due to COVID-19 pandemic preventing them from physically attending education. Agreement is significantly higher among nurses (72%) than doctors (63%). Although opinion in Europe varied between doctors (47%) and nurses (64%), clinicians in Europe are least likely to agree (55%).

In Asia Pacific and South America, a significantly higher proportion of clinicians (72%) believe newly qualified colleagues lack hands-on training.

> "Nurses as well as new doctors are very undertrained today."
>
> — Doctor (USA), 2023 survey

Statement: Newly graduated clinicians lack hands-on practical training due to COVID-19, which is impacting care for patients

Region and Country	Base Sizes	% Clinicians Agree (n=2,607)		% Doctors Agree (n=1,950)		% Nurses Agree (n=657)	
TOTAL	2,607	67		63 🔴		72 🟢	Dr
Asia Pacific	807	72 🟢	EU, NA	68 🟢	EU	76	
Europe	912	55 🔴		47 🔴		64 🔴	
North America	934	67	EU	63	EU	71	
South America	345	72 🟢	EU	70 🟢	EU, NA	74	
Mid. East & Africa	120	Low Base	EU	70	EU	Low Base	
China	418	67		59		76	
UK	272	67		59		75	
USA	365	67		65		70	

🟢 🔴 Significantly higher or lower than total

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP	North America = NA	China = CH	Dr = Doctors
Europe = EU	South America = SA	UK = UK	Nu = Nurses
Mid. East & Africa = MEA		USA = US	

Question: B1. 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.

Future proofing with training

Considering the shortages facing clinicians and the lack of hands-on training in new graduates, sufficient, appropriate training is critical to future proofing the sector. Unprepared graduates put additional strain on supervisors, who want to protect the quality of patient care. And by fast-tracking junior doctors to fill resource gaps left due to the pandemic, some institutions around the world may have exacerbated the situation.[29]

Data from the Association of American Medical Colleges (AAMC) shows medical students in the USA who are satisfied with the quality of their medical education had risen back to 83% in 2022 after a dip during COVID-19. Importantly, nearly all respondents in 2022 (97.7%), 2021 (97.7%) and 2020 (98.3%) plan to have a career providing patient care.[30]

So how can we ensure their training is adequate?

Half of clinicians prioritize training, placing it at #2

The #2 near-term priority clinicians set in the 2023 Clinician of the Future survey is improving the continuous training of clinicians, with 49% globally considering this a priority for the next 2-3 years.

Significantly more doctors (56%) than nurses (42%) agree. Concern was highest in South America, with 67% of clinicians considering this a priority (74% doctors, 60% nurses) and in Middle East and Africa, with 69% of doctors considering this a priority.

Improving the continuous training of clinicians is less of a priority in China, with 37% of clinicians agreeing, especially for nurses (24%). While it is lower priority in the UK (39%), almost half (48%) of clinicians in the USA consider it a priority, with significantly more nurses (55%) agreeing.

Solution: AI-powered education

> "[The future] is bright especially with advanced education and job responsibilities in the nursing profession."
>
> — Nurse (USA), 2023 survey

There is a potential facilitative role for digital technology, particularly AI, both in the delivery of continuous training and in helping improve newly qualified clinicians' readiness.

Clinicians see the benefits of students using AI to learn nursing and medicine. In the 2023 survey, 50% consider using AI desirable to learn nursing, compared to 28% undesirable. Similarly, 51% consider AI desirable for medical students, compared to 28% undesirable. (See chapter 2 for details.) They note that AI as a training tool could help make learning time and cost efficient.

> "Medical students need to have a wide range of knowledge. AI can expertly give you comprehensive knowledge and can meet learning needs. This technology is convenient, mobile phone and computer can be used, and there is almost no learning cost. It is very convenient."
>
> — Doctor (China), 2023 survey

However, clinicians stress that it should be an adjunct — not a replacement — to face-to-face learning experiences. Some consider it posing as a danger of replacing hands-on experience, and others are concerned it may teach inaccurate or erroneous information, while hindering critical thinking and decision making in students.

> "My concern about this is how do we teach healthcare students — nursing, medical, or allied professions — to assess patients & make judgements if we merely instruct them to input data into an AI tool."
>
> — Doctor (Australia), 2023 survey

According to Deloitte,[31] healthcare providers are considering digital technology as a tool to increase efficiencies and lower costs, while helping reduce the administrative burden on clinicians. In essence, digital technology, including AI, has the potential to help clinicians do more with less.

To make this work, clinicians will need proper training. In the *Clinician of the Future Report 2022*, we saw that 69% of clinicians expected digital health technologies to be a challenging burden, and 69% already felt overwhelmed by patient data. Any upskilling that takes place will need to be done in a way that does not negatively affect them or their work.

Clinicians themselves are positive about digital upskilling. In the 2023 survey, 73% of clinicians globally consider physicians having more expertise in digital health technology to be desirable, compared to 9% considering this undesirable. Similarly, 71% say it is desirable for nurses to be expert in the use of digital health technology, compared to 10% considering this undesirable. (Please see the full research analysis accompanying this report for more detail.)

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Clinician of the Future 2023

Technology and AI are empowering clinicians

Chapter 2

Health | Clinician of the Future

ELSEVIER

Technology and AI are empowering clinicians

➤ Clinicians say it's desirable for doctors (73%) and nurses (71%) to be digital experts

➤ 11% of clinical decisions are currently assisted by AI tools

➤ 48% find it desirable for physicians to use AI in clinical decision making

➤ 68% find it desirable that patient-collected data informs clinical decisions

➤ 55% find telehealth desirable as the main mechanism for routine check-ups

➤ 51% consider AI desirable for training doctors, 50% for training nurses

The dependency on technology has always been high among clinicians, but the appetite for it as an enabling tool is increasing, as it is perceived to help address time pressures, create efficiencies and enhance clinical practice. There is an appetite to use generative AI tools to learn and inform their decision making, and a growing desire among clinicians to have digital technology expertise, especially as they anticipate using patient collected data to help make decisions. The Future Tech-Savvy Clinician is closer than clinicians may have imagined: many of their predictions for healthcare a decade in the future now seem to be on the 2-3 year horizon. This includes using generative AI tools, though there are differences of opinion and debate around future use of AI.

Digital technology in healthcare covers a broad range of tools, devices and approaches, including telehealth, monitoring devices and wearables, data sharing, and AI. And it's moving fast: the digital landscape has changed significantly since the *Clinician of the Future Report 2022*.

For example, newly appearing technologies were evident in a Deloitte US Center for Health Solutions survey of over 600 physicians.[1] In 2022, 67% of respondents said they implemented video visits, up from 19% in 2020 and 14% in 2018. Chatbots appeared as a new channel in 2022, though only 4% of physicians reported introducing the technology.

Most notably, generative artificial intelligence (AI) has grown exponentially in the last year. ChatGPT, the generative AI platform from Open.ai, reached 100 million users within just two months of launch.[2] For comparison, it took YouTube 1.5 years and Twitter 5 years to reach that number.

Although generative AI is still relatively young on the market, it has attracted attention across sectors, including healthcare, in particular for its ability to automate repetitive tasks, save clinicians' time and create other efficiencies in the healthcare system. As of July 2023, AI adoption rates among 7,502 businesses surveyed by IBM varied geographically, with China far ahead — 58% of businesses had adopted AI and 30% were exploring it. In comparison, just 25% of businesses in the USA and 26% in the UK had adopted AI.[3]

A digital tour of our focus countries

The possibilities of digital technology in healthcare are almost unlimited, so rather than looking in detail at the full global picture, we'll take a snapshot of some of the projects and approaches happening in our three focus countries: China, the UK and the USA.

USA

With increasing use of digital technology, for example for scanning, diagnosing and monitoring patients, more and more people encounter AI in healthcare. However, there has also been widespread hesitancy reported: in a Pew Research Center survey of over 11,000 people, one-third said using AI to do things like diagnose disease and recommend treatments would lead to worse outcomes.[10] Despite this, the USA is ramping up its AI efforts in 2023, with the U.S. General Services Administration (GSA) launching the Applied AI Healthcare Challenge[11] and Kaiser Permanente launching its $3 million AIM-HI program.[12]

UK

The National Health Service (NHS) is running projects like the NHS AI Lab to extract the benefits of AI for patients, clinicians and the country's wider health ecosystem.[7] In particular, the project is supporting technological development for purposes like improving efficiencies, helping the workforce and improving patients' experiences of the NHS.[8] The NHS is also actively investigating opinions of AI, including with a survey of more than 1,000 people in England.[9] This revealed the importance of the patient–clinician relationship in deploying AI successfully.
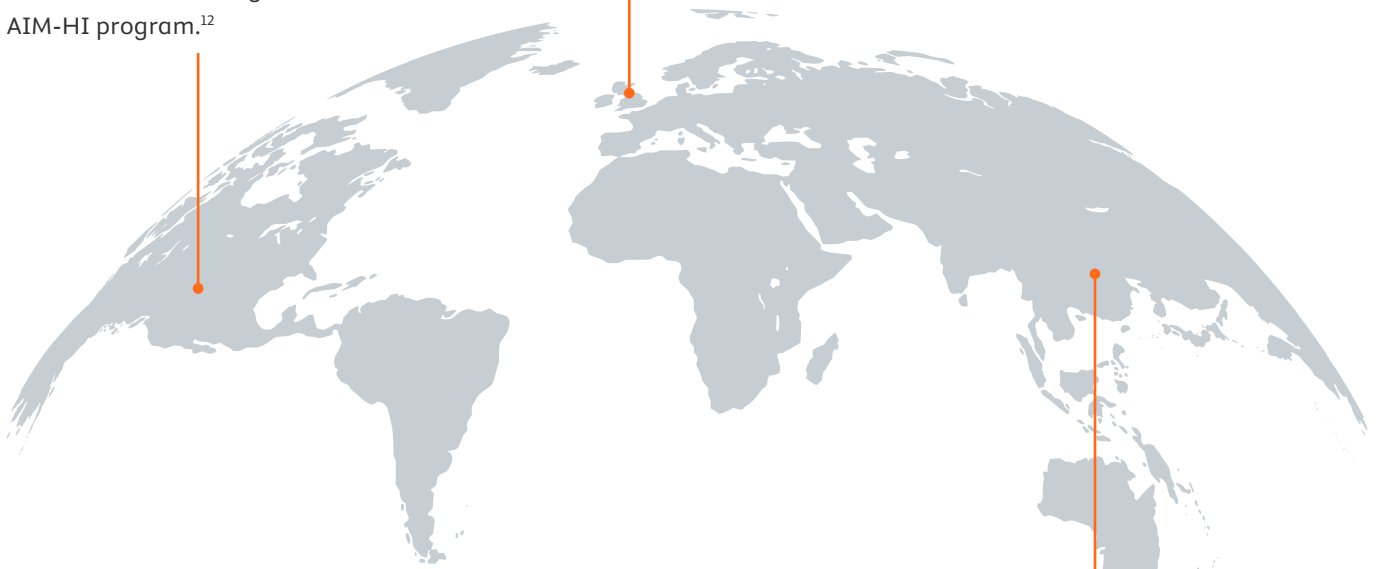
China

As part of China's 14th Five-Year Plan for National Health Informatization, the government published the Opinions on Promoting the Development of "Internet + Healthcare" outlining its approach to bringing health and tech together in a bid to counter the country's weak primary care system.[4, 5] The intention is for a single platform for China to provide health information that is more unified and authentic, as well as in line with political requirements.

Patients and clinicians in China are very familiar with internet-powered healthcare, having used internet hospitals since 2015.[6] Just five years later, there were almost 55 million active internet healthcare users, accessing the full range of healthcare services.

The empowered clinician

> "It ... seems increasingly clear that AI systems will not replace human clinicians on a large scale, but rather will augment their efforts to care for patients."[13]
>
> — Thomas Davenport and Ravi Kalakota,
> *Future Healthcare Journal*

As we have seen, there is considerable strain on many healthcare systems, with critical staff shortages projected globally (see chapter 1). By improving efficiencies across the system, from administration tasks to patient management, technology can reduce the burden on clinicians, potentially reducing stress and increasing job satisfaction.
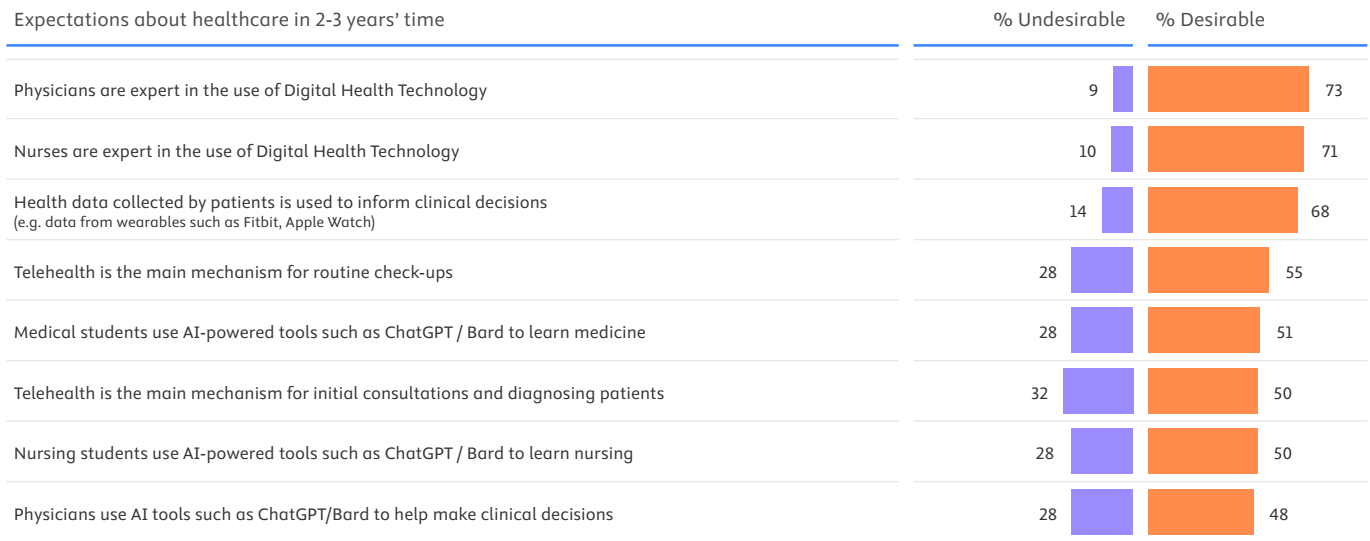
Today, technology is helping clinicians learn and make decisions. It is not displacing or replacing clinicians and their thought processes, but rather supplementing and supporting them, enabling clinicians to work more efficiently and effectively. While they are curious and sometimes hesitant about the newer generative AI tools, clinicians are open to the possibilities of the evolving technologies at their fingertips and willing to embrace them to improve patient care.

This is reflected in the pattern of desirability we see across the responses to this year's survey. Overall, clinicians see it as positive to be experts in the use of digital health technology (73% for physicians to be experts and 71% for nurses) – a recognition of the accelerating developments in this area.

Clinicians tend to be more positive about applications of technology in which the tools are supporting them as experts and for more routine tasks. For example, 68% find it desirable to use data from wearables to inform their clinical decisions, and nearly half (48%) find it desirable to use generative AI to help them make those decisions. They find it desirable to use telehealth for routine check-ups (55%), which is more than for initial consultations and diagnoses (50%), reflecting the importance of clinician–patient contact.

Expectations about healthcare in 2-3 years' time	% Undesirable	% Desirable
Physicians are expert in the use of Digital Health Technology	9	73
Nurses are expert in the use of Digital Health Technology	10	71
Health data collected by patients is used to inform clinical decisions (e.g. data from wearables such as Fitbit, Apple Watch)	14	68
Telehealth is the main mechanism for routine check-ups	28	55
Medical students use AI-powered tools such as ChatGPT / Bard to learn medicine	28	51
Telehealth is the main mechanism for initial consultations and diagnosing patients	32	50
Nursing students use AI-powered tools such as ChatGPT / Bard to learn nursing	28	50
Physicians use AI tools such as ChatGPT/Bard to help make clinical decisions	28	48

Question: D3. Thinking about healthcare in 2-3 years' time to what extent do you believe the following are desirable or not desirable? Please consider the future of healthcare within the primary country that you work in.

n=2,607

> "AI tools can help provide information and effective management and nursing work, but it cannot replace practical experience, interaction and communication with patients."
>
> — Nurse (China), 2023 survey

This point comes through in many of the comments that clinicians shared in the survey: concern that the use of digital tools does not push the human connection out of clinical work, especially when it comes to the patient–clinician partnership. This sentiment is expressed more widely, including in Deloitte's 2023 Global Health Care Outlook: "Virtual health can only be effective if it retains a human element to care delivery."[14] The key is for patients to perceive these technologies the way clinicians use them: "as an enhancement to care."

Digital experts

Clinicians have been developing their digital skills for many years, to keep ahead of the increasingly digitalized environment in which they work. Using electronic health records (EHRs), analyzing data from wearables and connecting with patients via telehealth are all common activities in a clinician's daily work.

Most clinicians find it desirable for doctors and nurses to have digital expertise

Overall, most clinicians consider it desirable for physicians (73%) and nurses (71%) to be expert in the use of digital health technologies. They shared benefits, such as efficiencies in terms of time, resources and costs, and better outcomes for patients. Some believe digital expertise in doctors can make for better decision making.

However, 9% of respondents find it undesirable to have digital expertise. They shared some potential negative impacts, such as doctors becoming too reliant on technology and losing empathy or the human touch and detracting from nurses' patient interactions. Some respondents also pointed out the burden of learning, raising the issue that some nurses are over-stretched and lack digital knowledge.

Notably, 79% of doctors in the Middle East and Africa consider it desirable for doctors to have digital expertise. Nurses in North America (78%) and doctors in the Middle East and Africa (78%) find it desirable for nurses to have digital expertise.

The picture is less clear cut in China, with 81% of doctors considering expertise in physicians in digital health technology desirable and 4% undesirable, while only 46% of nurses consider it desirable in physicians and 5% undesirable.

Nurses in China are similarly unconvinced of the desirability of their own expertise in digital health technology, with 48% considering it desirable, compared to a global average of 71% of clinicians.

"Save time, improve efficiency, improve diagnosis and treatment."

— Doctor (China), 2023 survey

These findings follow the trajectory we identified in last year's Clinician of the Future report, in which 10% of clinicians ranked data analytics/statistical knowledge in the top 3 skills of today, rising to 37% in 10 years.[15] The 2023 survey reveals clinicians' expectations that they will use digital health technologies more and more.

Most clinicians welcome patients sharing health data collected on wearables

Most clinicians (68%) find it desirable that health data collected by patients is used to inform clinical decisions (e.g. data from wearables such as Fitbit, Apple Watch) in the next 2-3 years. Clinicians in Europe although supportive find this less desirable (61%) and almost one in five (19%) find it undesirable.

Conversely, clinicians in North America are more positive about the move towards patient-collected data, with 71% finding it desirable and only 11% undesirable. Nurses in the USA (74%) and doctors in China (75%) are most likely to find this desirable, while nurses in China (48%) are significantly less enthusiastic.

"Remote data acquired in real world settings with more than a snapshot of data available in person, also accurate data rather than only patient report."

— Doctor (USA), 2023 survey

Clinicians in South America are most likely to consider the use of wearables to collect data as undesirable, at 19% of doctors and 24% of nurses.

Some of the major concerns that clinicians shared are around the inaccuracy of data from wearables and the risk of misdiagnosis.

"Possibly incorrectly acquired data, through incorrectly applied tools and thus incorrect information [...] false diagnoses, false therapies -> dissatisfaction on all sides."

— Nurse (Austria), 2023 survey

Using scientific research effectively in clinical practice is a priority, especially in China

Evidence is helpful in countering misinformation and inaccuracy, and this is reflected in clinicians' priorities, with utilizing scientific research in clinical practice more effectively ranking #3 on the list. Clinicians in China find this most important (52%), with concern lower in the USA (42%) and UK (32%). Globally, 46% of clinicians ranked this as a priority, with doctors (51%) more likely to do so than nurses (41%).

The rise of telehealth

In the wake of the COVID-19 pandemic, in-person appointments are possible again, but telehealth has become a mainstay of modern healthcare. In the 2022 survey, 63% of clinicians expect most of their consultations to be remote in 10 years. This year's survey shows progression along that path: 76% of interactions are still in-person, but clinicians expect this to be closer to 64% in 5 years.

However, this recognition is not without reservation: in 2022, 51% of clinicians agreed telehealth will negatively impact their ability to demonstrate empathy with patients.

Half of clinicians find telehealth for check-ups desirable, but opinion is divided

Compared to the use of wearables for collecting patient data, clinician opinion is more divided over the use of telehealth. Globally, 55% of clinicians find it desirable for telehealth to be the main mechanism for routine check-ups in the next 2-3 years, while 28% find it undesirable.

The increasing use of telehealth has implications – both positive and negative – for accessibility; see Chapter 4 for survey respondents' views on this.

Division is greatest in North America, where 44% find it desirable and 40% undesirable.

Among doctors in North America, more find it undesirable (45%) than desirable (39%). Clinicians who find telehealth as a main mechanism for routine check-ups most desirable are nurses in South America (65%) and doctors in China (69%).

Many clinicians welcome telehealth as an efficient way to connect with patients routinely, but they are mindful it won't be accessible for all patients and may hinder rapport. They also see the benefits of convenience and efficiency.

> "Physical examination cannot be done and there is the loss of human touch which is vital in healthcare."
>
> – Doctor (Philippines), 2023 survey

> "Screening of patients on telephones will reduce the burden on healthcare provider and health sector to focus on patients more desirable for health care".
>
> – Doctor (India), 2023 survey

Clinicians are less enthusiastic about telehealth for diagnosis

Clinicians are even more divided about the use of telehealth as the main mechanism for initial consultations and diagnosing patients in the near future: 50% of clinicians globally find this desirable versus 32% undesirable. This highlights some of the concerns of telehealth, such as missing important information for diagnosis that can only be collected in-person.

> "Many surgical specialties require face to face consultation for accurate examination findings."
>
> – Doctor (UK), 2023 survey

> "The information obtained remotely is not comprehensive; doctor-patient relationship isn't strong."
>
> – Doctor (China), 2023 survey

There is a clear difference of opinion between doctors and nurses in Europe and North America: doctors find it more undesirable (53% in Europe and 52% in North America) than desirable (33% in Europe and 32% in North America), while more nurses find it desirable (45% in Europe and North America) than undesirable (36% in Europe and 39% in North America).

Similar to the use of telehealth for routine check-ups, its use in initial consultations is most desirable among nurses in South America (65%) and doctors in China (71%). This may reflect developments in China's internet healthcare, where remote triage is helping reduce burden on the system.[16]

> "Through the initial screening can greatly reduce the problem of insufficient medical resources."
>
> — Nurse (China), 2023 survey

> "Triage and prioritisation of patients. Optimise time with patient and reduce hospital visits."
>
> — Doctor (Spain), 2023 survey

Clinicians recognize the need for virtual consultations.

Despite some reservations about the impact of telehealth on the clinician–patient partnership, more than a quarter (27%) of clinicians recognize managing consultations between clinicians and patients remotely as a top-five priority in the next 2-3 years. This is significantly higher among doctors (30%) than nurses (23%). And in China, almost half (48%) of doctors consider this a priority.

Artificial intelligence as an assistant in decision making

> "The era of AI in medicine, as well as new treatment options is coming."
>
> — Doctor (Serbia), 2023 survey

Artificial intelligence (AI) and machine learning are developing at an unprecedented rate. AI tools can help clinicians analyze data, including medical images, make diagnoses and put personalized treatment plans together.

> "AI can empower a trained physician to consider wider differential diagnosis and management plan".
>
> — Doctor (UK), 2023 survey

Last year, about half (56%) of clinicians predicted they would be using AI-based tools in clinical decision making in a decade. The most notable development since our last report has been in the field of generative AI.

ChatGPT (OpenAI)[17, 18]	Bard (Google)[19, 20]
Launched: 30 November 2022	Launched: 21 March 2023
Users: 100 million	Users: 30 million
Coverage: 82% of the world (not China)	Coverage: 180 countries (including China)
Top users: USA (12.31%), India (7.6%), Japan (4.26%)	Top users: US (62.6%), UK (8.29%), China (3.22%)
Language model: GPT-3.5	Language model: LaMDA (Language Model for Dialogue Applications)
Data: Up to 2021	Data: current

Information correct as of July 2023

Responses to the questions about generative AI in the 2023 Clinician of the Future survey give a sense of how fast it is progressing; 11% of clinical decisions are currently assisted by generative AI.
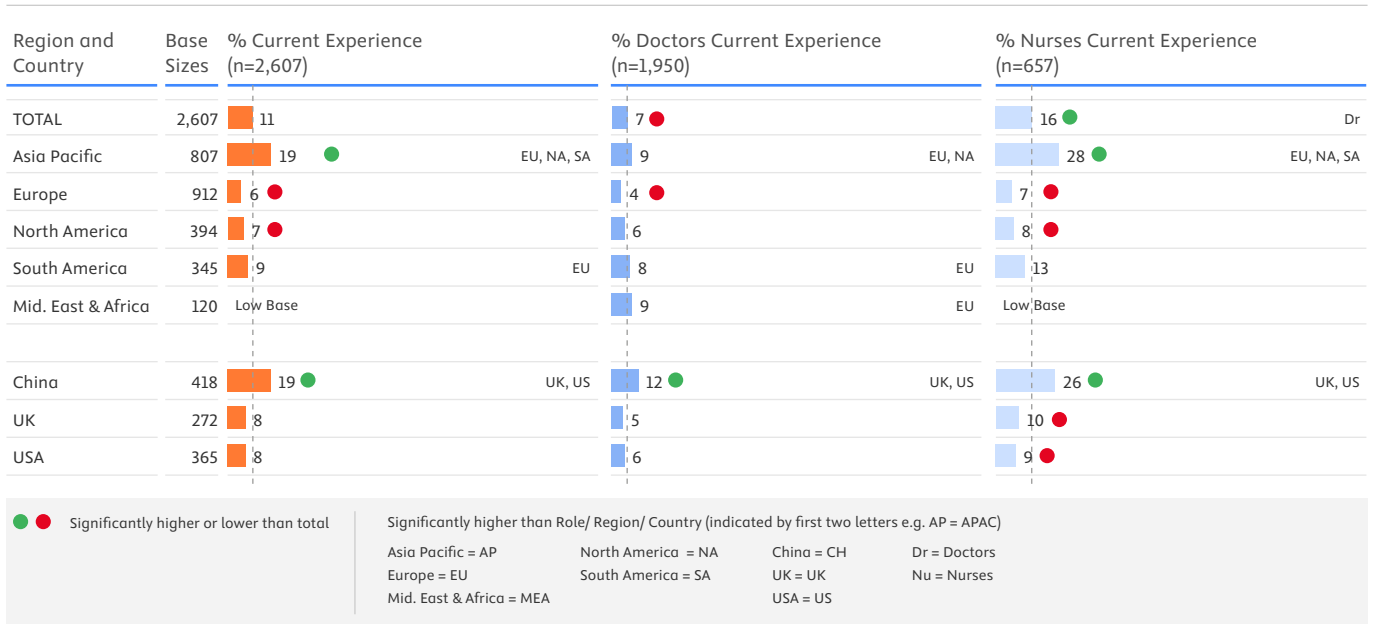
Few clinical decisions are made using generative AI, but this will shift in the future

We are already seeing differences in how clinicians use generative AI tools like ChatGPT and Bard: use of these tools to help clinical decisions is significantly higher among nurses (16% of their decisions) than doctors (7% of their decisions) globally.

Use also differs greatly between regions. Significantly fewer clinical decisions use AI in Europe (6%) and North America (7%). However, in Asia Pacific, use of AI is much higher: 19% of clinical decisions, including 28% of nurses' decisions, use these tools today.

Looking at the three focus countries, use of generative AI for clinical decision making is much more common in China (19% of clinical decisions) compared to the UK and USA (8%). Although use is higher among nurses in all three cases, it is notably high in China (26% of clinical decisions).

Statement: Your clinical decisions are assisted by AI tools such as ChatGPT / Bard

Region and Country	Base Sizes	% Current Experience (n=2,607)		% Doctors Current Experience (n=1,950)		% Nurses Current Experience (n=657)	
TOTAL	2,607	11		7 ●		16 ●	Dr
Asia Pacific	807	19 ●	EU, NA, SA	9	EU, NA	28 ●	EU, NA, SA
Europe	912	6 ●		4 ●		7 ●	
North America	394	7 ●		6		8 ●	
South America	345	9	EU	8	EU	13	
Mid. East & Africa	120	Low Base		9	EU	Low Base	
China	418	19 ●	UK, US	12 ●	UK, US	26 ●	UK, US
UK	272	8		5		10 ●	
USA	365	8		6		9 ●	

● ● Significantly higher or lower than total

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP · North America = NA · China = CH · Dr = Doctors
Europe = EU · South America = SA · UK = UK · Nu = Nurses
Mid. East & Africa = MEA · · USA = US

Question: B5. Today, what proportion of ... (Average calculated from response bands.)

This could indicate the potential the technology has to reduce administrative burden on clinicians, especially nurses. From voice-activated assistance systems to Internet of Things (IoT) devices, AI-powered technology could make a big difference while nurses continue to face shortages.[21]

> "Spend less time on papers doing the bureaucratic part and can have a better reading about the patient's conditions."
>
> — Nurse (Brazil), 2023 survey

> "So that by the time they start work, they are already knowledgeable and equipped with the skills needed in using AI-powered tools."
>
> — Nurse (UK), 2023 survey

Looking at desirability of clinicians to use AI in their clinical decision making, we can expect the current usage to increase over time. Indeed, the infancy of the technology was one of the concerns respondents raised.

> "These tools are not yet based on scientific evidence, do not provide references, and are not yet reliable."
>
> — Doctor (Brazil), 2023 survey

About half of clinicians find it desirable to use AI in future decision making

When asked about physicians using these tools in clinical decision making in the future, almost half (48%) of clinicians globally find it desirable, while more than one-quarter (28%) find it undesirable.

China's clinicians are most positive: fewest clinicians responded that they find the future use of AI undesirable in China (17%), particularly among doctors (15%), who are also significantly more likely to find it desirable (61%).

> "Technologies like AI and big data used as auxiliary tools will reduce the chance of misdiagnosis and errors."
>
> — Doctor (China), 2023 survey

Significantly more clinicians find the future prospect of AI use desirable in Asia Pacific (55%) and South America (55%), while fewer show concern in Asia Pacific (23% undesirable) than South America (32% undesirable).

In Europe, opinion is more divided, with 39% finding future clinical use of generative AI desirable, compared to 33% undesirable. More European doctors (45%) than nurses (33%) find it desirable. Similarly, in North America 42% of clinicians find it desirable and 31% find it undesirable. However, in this region, doctors (39%) are less likely than nurses (45%) to find it desirable.

This concern among clinicians in the USA is echoed in other studies, for example, over three-quarters consider it very important (56%) or somewhat important (22%) for technology companies and governments to manage AI applications in disease diagnosis carefully.[22]

Statement: Physicians use AI tools such as ChatGPT / Bard to help make clinical decisions

Region and Country	Base Sizes	% Clinicians Considering (n=2,607) Undesirable	Desirable		% Doctors Considering (n=1,950) Undesirable	Desirable		% Nurses Considering (n=657) Undesirable	Desirable	
TOTAL	2,607	28	48		28	49		29	47	
Asia Pacific	807	23	55 ●	NA, EU	23	52	NA, EU	24	59 ●	NA, EU
Europe	912	33	39 ●		32	45 ●		33	33 ●	
North America	394	31	42 ●		32	39 ●		30	45	EU
South America	345	32	55 ●	NA, EU	32	55 ●	NA, EU	31	54	EU
Mid. East & Africa	120	Low Base			27	57 ●	NA, EU	Low Base		
China	418	17	53 ●	UK, US	15	61 ●	UK, US	22	45	
UK	272	33	34 ●		37	33 ●		29	35 ●	
USA	365	30	42 ●	UK	31	40 ●		30	45	

● ● Significantly higher or lower than total

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP	North America = NA	China = CH	Dr = Doctors
Europe = EU	South America = SA	UK = UK	Nu = Nurses
Mid. East & Africa = MEA		USA = US	

Question: D3. Thinking about healthcare in 2-3 years' time to what extent do you believe the following are desirable or not desirable? Please consider the future of healthcare within the primary country that you work in.

Who's in control?

One of the concerns raised was related to the role of AI. Clinicians are more positive when talking about it as an enabling tool under the control of the clinician. But if that control were to shift, for example by leading the diagnosis or even being used as the clinical expert in partnership with a non-expert, clinicians are more critical.

> "Eventually utilizing AI will help improve patient flow and effectiveness of visits; [but] I am somewhat concerned that healthcare corporations will use AI to save costs by pairing AI with non-physicians, rather than utilizing AI with physicians."
>
> — Doctor (USA), 2023 survey

This concern is echoed in patient feedback. There was backlash in the USA when it emerged that some healthcare organizations were using ChatGPT to draft clinician messages without telling patients.[23] People are keen to know they are in safe hands — and many prefer those to be real. According to the Patients Association, 4 in 10 patients believed a face-to-face consultation would have been better, compared to 1 in 10 favoring telehealth.[24]

Although many patients recognize the value of technology for improving their health or increasing system efficiencies, they are much less convinced about it supporting clinical decisions. In an NHS survey of over 1,000 patients, 41% would trust AI to help doctors and nurses make better decisions.[25] But respondents' number one option for increasing their confidence was "Easy access to speak to a doctor or nurse if I don't trust the results."

Similarly, in a survey of patients in Germany, although half (56%) recognized the benefit of AI, 20% would refuse to be treated using AI-based applications, and almost all (96%) agreed AI needs to be controlled by the clinician.[26]

Will AI support clinician training in the future?

Clinicians often lack the right training to keep up with the evolving demands in healthcare, including the rise of digital health technologies. As we saw in chapter 1, many clinicians now consider continuous training a priority.

In the *Clinician of the Future Report 2022*, we noted that the body of medical knowledge continues to grow, and combined with increasing specialization, which is often overwhelming, clinicians can no longer store everything in their memories. This has implications for training, which AI could help address.

In the 2023 survey, clinicians identified many advantages to using AI tools in medical and nursing education, including increased efficiency and decreased cost, as well as supporting in-depth knowledge acquisition. But in line with use of AI in clinical decision making, global opinion is split on its desirability in clinician training, both for medical students and nurses. Following the pattern of AI being more accepted in China, desirability of AI in medical training is highest among doctors in China, at 72%.

Clinicians in China are much more likely to find AI in education desirable

Globally, 51% of clinicians consider the use of AI desirable for training medical students, and 50% for training nurses. In both cases, 28% of clinicians consider it undesirable.

For medical student training, opinion is most split in Europe and North America. In both cases, more clinicians find it desirable (41% in Europe and 40% in North America) than undesirable (34% in Europe and 36% in North America).

Looking at the focus countries, the UK is least enthusiastic about the future use of AI in medical training, with more clinicians finding it undesirable (38%) than desirable (33%). Doctors in North America (43%) and Europe (33%) find the use of AI in medical training least desirable and doctors in China find it most desirable (72%).

When it comes to use of AI in nursing education, clinicians in Asia Pacific (59% desirable) and South America (60% desirable) are most positive, while those in North America (36% undesirable) and Europe (34% undesirable) are most concerned.

The use of AI in nurse training is most welcomed by nurses in Asia Pacific and South America (63% desirable) and when looking at the focus countries least welcomed by doctors in the UK (43% undesirable) and USA (41% undesirable).

Again, fewest clinicians in China find the use of AI in nurse training undesirable (13%), though the enthusiasm is more tempered than for medical student training (60% desirable).

> "Medical students will make maximum use of AI; they will save time and money and [...] learn more advanced things that may not be available in the institution."
>
> — Doctor (Oman), 2023 survey

> "Medical students should learn the thinking process in basic Medicine. They shouldn't only seek the result."
>
> — Doctor (Japan), 2023 survey

> "Human contact is essential for medical training and the exercise of medicine."
>
> — Doctor (Luxembourg), 2023 survey

Statement: Nursing students use AI-powered tools such as ChatGPT / Bard to learn nursing

Region and Country	Base Sizes	% Clinicians Considering (n=2,607) Undesirable / Desirable		% Doctors Considering (n=1,950) Undesirable / Desirable		% Nurses Considering (n=657) Undesirable / Desirable	
TOTAL	2,607	28 / 50		28 / 50		27 / 50	
Asia Pacific	807	21 / 59 ●	NA, EU	21 / 55 ●	NA, EU	20 / 63 ●	NA, EU
Europe	912	34 / 40 ●		35 / 44 ●	NA	32 / 37 ●	
North America	394	36 / 38 ●		42 / 33 ●		33 / 43	
South America	345	27 / 60 ●	NA, EU	28 / 57 ●	NA, EU	27 / 63 ●	NA, EU
Mid. East & Africa	120	Low Base		26 / 52	NA	Low Base	
China	418	13 / 60 ●	UK, US	11 / 65 ●	UK, US	17 / 55	UK
UK	272	38 / 34 ●		43 / 34 ●		32 / 35 ●	
USA	365	35 / 38 ●		41 / 34 ●		32 / 43	

● ● Significantly higher or lower than total

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP   North America = NA   China = CH   Dr = Doctors
Europe = EU   South America = SA   UK = UK   Nu = Nurses
Mid. East & Africa = MEA   USA = US

Question: D3. Thinking about healthcare in 2-3 years' time to what extent do you believe the following are desirable or not desirable? Please consider the future of healthcare within the primary country that you work in.

Solution: clinician-controlled AI built on trust

> "We can only achieve higher quality, lower cost health care by augmenting the physician-patient relationship with AI at the point of care."[27]

— Ronen Lavi, writing in *RISE*

Digital health technology and AI will continue to evolve, and their use in healthcare will expand in the coming years. Their impact will depend on how they are developed and used.

In order to reach the possible future we outlined – where data is used for better patient outcomes, there is less administrative burden and more time for patients and learning, and the clinician–patient relationship is maintained virtually – there is still work to do. Training in the use of digital health technologies and in soft skills will continue to be critical, for example. In the recent Digital Doctor Survey of 3,428 physicians, 62% shared their concern about having a lack of training.[28]

Currently, digital health technologies and AI are welcomed more in China than the UK and USA. This is reflected across all sectors: according to PwC's 'Hopes and Fears' research, people in the Asia Pacific region are considerably more positive about the benefits of AI compared to those in the UK: 41% of respondents in Asia Pacific said AI will increase their productivity and efficiency at work,[29] compared to just 19% in the UK.[30]

This was also a pattern in the 2022 Clinician of the Future survey, which revealed less enthusiasm for the potential of digital health in the USA and Europe. Indeed, 80% of clinicians in the USA agreed it will be a challenging burden in 10 years.

Improved systems may help address this. With efficient, integrated systems – and the time to learn them – clinicians around the world may be able to use and benefit more from technology. To ensure it is beneficial for all, clinicians need to remain in control of the tools, and there should be transparency around this, particularly towards patients.

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Knowledge and technology are transforming the clinician–patient relationship

Chapter 3

Health | Clinician of the Future

ELSEVIER

Knowledge and technology are transforming the clinician–patient relationship

Clinicians think that:

➤ Two in five (41%) patients are health literate today

➤ Half (49%) of patients will be health literate in 2028

➤ Knowledge of social determinants of health (SDOH): 35% today ➔ 48% in 5 years

➤ Active management of health: 38% today ➔ 49% in 5 years

➤ Use of monitoring tools: 27% today ➔ 45% in 5 years

➤ 61% of clinicians have enough time to provide good patient care

There is a trend towards patient empowerment, with clinicians expecting their health literacy, knowledge of social determinants of health (SDOH) and proactive health management to grow in the coming five years. As the use of wearables increases and interactions become more virtual, clinicians may need to upskill. This progress toward the Future Partner for Health that we envisioned in the *Clinician of the Future Report 2022* will be supported by developments in digital technology, including artificial intelligence (AI).

> "The clinician of the future will encounter the patient of the future, who will be more informed, engaged and empowered."
>
> — *Clinician of the Future Report 2022*

In the *Clinician of the Future Report 2022*, we saw a strong trend toward patient empowerment. Clinicians were already observing a shift, with 56% globally agreeing that patients had become more empowered to manage their own conditions over the preceding decade. The future, they predicted, would see the clinician–patient relationship become more of a partnership.

Despite foreseeing that patients would be more likely to manage their own health, clinicians recognized the continued importance of soft skills like listening and being empathetic, and the need for sufficient time with their patients.

As we saw in Chapter 1, 61% of clinicians believe they have enough time to provide good patient care, up from 52% in 2022. This provides an important foundation as clinicians move towards a stronger patient empowerment paradigm. The shift to patient-centered or patient-managed healthcare is a necessary response to the already overburdened healthcare systems around the world. With our growing, aging population, the number of people with chronic health conditions and noncommunicable diseases (NCDs) is rising.

The rise of NCDs was one of a number of drivers of change that emerged in the *Clinician of the Future Report 2022*. With increasing empowerment comes greater consumer behavior, and 90% of clinicians in 2022 agreed that quality measures, including patient satisfaction, had driven change in healthcare in the last decade.

Most clinicians (86%) also agreed that the rise of patients informed about their health conditions was driving healthcare change. In the 2023 survey, we took the pulse of health literacy and other indicators of patient empowerment, showing the progress and projections.

In the empowered patient scenario, in which the clinician is a partner for health, patients are often looking for two distinct types of support:

➤ **Empathetic** – clinicians employ their soft skills, such as listening and empathy, to support patients emotionally and provide comfort as well as more clinical support like diagnoses and treatments.

➤ **Functional** – patients are informed and self-managing, and clinicians can support them functionally with regular check-ins (often facilitated digitally.

Proportion of...	% Today	% Expect in 5 Years
Your patient interactions are face-to-face	76	64
Your patients are health literate	41	49
Your patients actively maintain their health (e.g. good nutrition and regular exercise)	38	49
Your patients are knowledgeable of their Social Determinates of Health (SDOH)	35	48
Your patients use monitoring tools to assess their health and well-being (Including: wearables)	27	45

Question: B5. Today, what proportion of ... (Average calculated from response bands.)

Question: D2. With regards to your expectations around patients and healthcare in the next 5 years, what proportion of...
(Average calculated from response bands.)

n=2,607

Progress toward improved health literacy

Health literacy: In this report we define it as the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.

Clinicians say there's room for improvement in patients' health literacy

Looking at the situation today, on average, clinicians say 41% of their patients are health literate. Doctors estimated this percentage to be lower (37%) and nurses higher (44%).

In Europe (37%) and South America (31%), clinicians estimated patients to be a little less health literate. Clinicians in Asia Pacific estimated more of their patients are health literate today (45%), with nurses' estimates high (51%). Agreement among clinicians is fairly consistent across the three key markets of China (45%), the UK (45%) and the USA (42%).

Clinicians expect health literacy to rise in the next five years

Looking to the future, clinicians expect their patients will be more health literate. Globally, clinicians expect nearly half (49%) of their patients to be health literate by 2028. Echoing the current pattern, doctors are less optimistic (45%) and nurses more optimistic (52%) about future health literacy globally.

Clinicians in Europe are least optimistic, expecting 41% of their patients to be health literate in the next five years (38% for doctors and 44% for nurses).

Clinicians in Asia Pacific are most optimistic about their patients' future health literacy, expecting 56% of their patients to be health literate (doctors estimating 52% and nurses 60%).

Statement: Your patients are health literate

Region and Country	Base Sizes	% Clinicians Current Experience (n=2,607)	
TOTAL	2,607	41	
Asia Pacific	807	45 🟢	EU, SA
Europe	912	37 🔴	SA
North America	394	42	EU, SA
South America	345	31 🔴	
Mid. East & Africa	120	Low Base	
China	418	45 🟢	
UK	272	44	
USA	365	42	

Statement: Patients will be health literate

Region and Country	Base Sizes	% Clinicians Expect in 5 Years (n=2,607)	
TOTAL	2,607	49	
Asia Pacific	807	56 🟢	EU, NA, SA
Europe	912	41 🔴	
North America	394	45	
South America	345	42 🔴	
Mid. East & Africa	120	Low Base	
China	418	57 🟢	UK, US
UK	272	46	
USA	365	46	

🟢 🔴 Significantly higher or lower than total

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)
Asia Pacific = AP   Europe = EU   Mid. East & Africa = MEA   North America = NA   South America = SA   China = CH   UK = UK   USA = US

Dr = Doctors   Nu = Nurses

Question: B5. Today, what proportion of ... (Average calculated from response bands.)

Question: D2. With regards to your expectations around patients and healthcare in the next 5 years, what proportion of... (Average calculated from response bands.)

These estimates of health literacy reflect other findings. In a 2022 study of the link between health literacy and outcomes, patients were classified adequate health literacy (50% of patients), 32% inadequate and 18% marginal.[1] Patients with inadequate health literacy are more likely to visit the emergency room, thus improving health literacy can be an effective step not only to improve outcomes for patients but also to prevent further overstretching healthcare systems. Indeed, by one estimate, social determinants of health (SDOH) account for about 80% of health outcomes.[2]

Patients with the lowest (and highest) health literacy have also been shown to have the lowest trust in healthcare systems.[3] Raising the lower literacy level could therefore help increase trust and strengthen the clinician–patient partnership.

Making progress in health literacy from today's 4 in 10 to the future's 5 in 10 health literate patients is not only in patients' hands – clinicians play an important role in facilitating improvement. For example, research shows that clinicians can help improve a patient's health literacy by using less jargon.[4]

Improving health literacy is not a simple or indeed a linear process. As we noted in the *Clinician of the Future Report 2022,* there are many factors associated with access to healthcare and health literacy, broadly defined as social determinants of health or social drivers of health (SDOH).[5]

Understanding SDOH to boost empowerment

Social Determinants of Health (SDOH) are defined in this report as non-medical factors that influence health – the conditions of daily life that impact quality of life outcomes.

Research has linked better health literacy to younger age (below 30), living in urban areas, and having a higher education, and inadequate health literacy to older age (above 59), primary education, and divorced parents.[6]

There are other factors that need to be considered: a study of health literacy disparities involving over 80 million people in the USA showed that more participants from minority immigrant groups had lower health literacy.[7]

> "Immigrant status has a strong, negative, direct effect on HL proficiency among racial/ethnic minorities in the USA. This may be a result of barriers that prevent equitable access to resources that improve proper HL [health literacy] proficiency."[8]

Becoming more health literate requires a better understanding of SDOH, and clinicians expect more of their patients to have an awareness of their own SDOH in the coming five years. This in turn will support the move to more self-management and empowerment.

Clinicians often have little impact on SDOH. For this reason, in the 2022 Clinician of the Future survey, 22% of respondents identified being restricted to treating patients when they're already ill as a top-3 priority challenge, making the move to value-based care even more important.[9]

Clinicians say one in three patients are knowledgeable about their SDOH

Clinicians globally estimate about one-third (35%) of their patients are knowledgeable about their SDOH, with doctors estimating lower rates (31%) than nurses (39%).

Clinicians in China estimate a higher proportion of their patients are knowledgeable of their SDOH (44%) than clinicians globally (doctors in China estimate 38%, nurses in China estimate 53%).

Patient knowledge of SDOH is considered lowest in South America (26%) and nurses estimate patients' knowledge lower still (24%). There is a similar picture in Europe (30%), though this time it's the doctors who estimate lower knowledge (26%).

Given the importance of understanding SDOH to better manage one's own health, it's good news that clinicians expect an improvement in the next five years.

Clinicians expect about half of patients will know about their SDOH by 2028

Fast-forward to 2028 and clinicians expect almost half (48%) of their patients to be knowledgeable of their SDOH. Again, doctors are less optimistic (44%) than nurses (51%).

However, this shift of some 10% is mostly influenced by clinicians in Asia Pacific, and China in particular. In APAC, clinicians expect 56% of their patients to be aware of their SDOH by 2028 (doctors 51%, nurses 61%), rising to 59% in China (doctors 55%, nurses 62%). The picture is less optimistic in the UK and USA (42%).

Progress will be critical to improving the wider healthcare system, including improving patient outcomes and working conditions for clinicians. In part one of the 2022 Survey of America's Physicians, 80% of respondents said the USA can only improve outcomes and reduce costs by addressing SDOH.[10] Nearly all physicians reported that their patients' health outcomes are influenced by at least one SDOH. In the survey, physicians identified several main strategies to address SDOH, including creating opportunities (time and financial) for physicians to direct efforts, and supporting patients to do manage their own health, including with technology.

A step forward in proactive health management

In the 2022 Clinician of the Future survey, 56% of clinicians agreed their patients will be more empowered to take care of their own health in the future. With positive momentum evident in this year's pulse survey, proactive health management is moving in the right direction.

Clinicians think more than one-third of patients proactively manage their health

Clinicians globally estimate that 38% of their patients actively maintain their health today, though doctors estimate this to be significantly lower, at 34%.

In a similar pattern to health literacy, clinicians in Asia Pacific estimate higher proactive health management among their patients (43%), with nurses most optimistic (50%). Estimates are highest in China (clinicians 46%, doctors 42%, nurses 50%).

Clinicians in Europe are less positive about their patients' self-management today, estimating only 33% of patients actively maintain their health; this was even lower in South America (27%). Clinicians in North America (36%) are just below the global average.

Clinicians expect about half of patients to embrace managing their own health

Clinicians expect the picture to improve somewhat in the next five years: they estimate that about half (49%) of patients will actively maintain their health in 2028, with doctors least optimistic (46%) and nurses more so (53%).
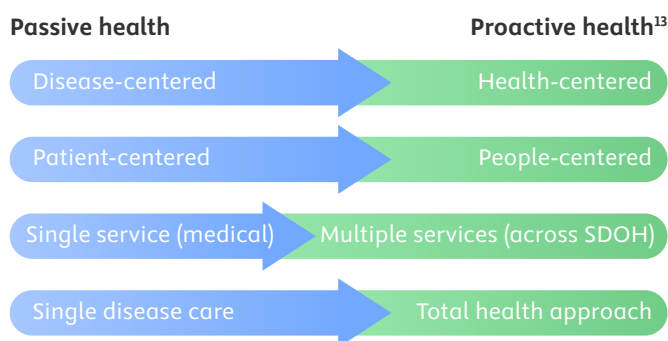
Again, expectations are significantly higher in Asia Pacific, at 56% of patients (doctors estimate 53%, nurses 60%). The estimate is similar in China (57%), with less of a difference between roles (doctors 57%, nurses 58%).

Enthusiasm for future proactive health management among patients in China reflects the country's move towards preventive healthcare in an increasingly value-based system.[11] (See chapter 4 for details.)

Expectations are lowest in Europe (total 42%, doctors 39%, nurses 45%) and South America (total 43%, doctors 42%, nurses 44%).

In our other focus countries, clinicians in the UK had relatively lower expectations at 43%. Responses are similar among clinicians in the USA, who estimate that 45% of patients will manage their health. More details are provided in the accompanying full results released with this report.

This progress could have knock-on effects on outcomes, if clinicians' expectations from the 2022 survey come to fruition. Where applicable, 60% of clinicians believed that patients who demonstrate that they actively maintain their health will be rewarded with lower health insurance premiums, which would in turn increase access to healthcare.[12]

Passive health	Proactive health[13]
Disease-centered	Health-centered
Patient-centered	People-centered
Single service (medical)	Multiple services (across SDOH)
Single disease care	Total health approach

A turning point for wearables

These trends towards enhanced health literacy and knowledge of SDOH are driven and supported by the increased use of health monitoring technologies, such as wearables. In the *Clinician of the Future Report 2022*, 77% of clinicians expect real-time patient analytics to be critical to personalized care in the future.

Taking the pulse of progress now shows the use of monitoring tools is also moving in the right direction to continue enabling patient empowerment.

Wearables are an increasingly common feature of patients' health management

More than a quarter (27%) of patients use monitoring tools, including wearables, to assess their health and well-being, according to clinicians globally.

Significantly more patients are thought to use monitoring tools in Asia Pacific (33%), particularly in China (36%), and in both cases, nurses estimate use to be significantly higher than the average (46% APAC, 48% China).

Conversely, patients in Europe are thought to use monitoring tools much less commonly (21%); it is a similar picture in South America (21%).

Statement: Your patients use monitoring tools to assess their health and well-being (incl. wearables)

Region and Country	Base Sizes	% Clinicians Current Experience (n=2,607)	
TOTAL	2,607	27	
Asia Pacific	807	33 🟢	EU, NA, SA
Europe	912	21 🔴	
North America	394	24	
South America	345	21 🔴	
Mid. East & Africa	120	Low Base	
China	418	36 🟢	UK, US
UK	272	22 🔴	
USA	365	24	

🟢 🔴 Significantly higher or lower than total

Question: B5. Today, what proportion of …
(Average calculated from response bands.)

Clinicians expect to see every other patient using monitoring tools

Globally, clinicians expect 45% of their patients to be using tools like wearables in five years' time, with doctors estimating significantly fewer (41%) and nurses significantly more (50%).

There is a similar pattern to the current picture of patients' use of wearables, with lower usage expected in future in Europe (42%) and South America (37%). In Asia Pacific, expectation is higher (50%) and highest in China (52%). Nurses in the Asia Pacific region expect more patients to use wearables (56%) than doctors do (45%).

> "Monitoring heart rate, and glucose could be very advantageous to manage chronic heart disease and diabetes."
>
> — Doctor (USA), 2023 survey

It is worth noting that in some cases, these percentages are double the current estimated usage. For example, clinicians in Europe expect twice as many of their patients to use wearables in five years (42%) than today (21%). This is indicative of a strong trend towards patient-managed health.

Statement: Patients will use monitoring tools to assess their health and well-being (incl. wearables)

Region and Country	Base Sizes	% Clinicians Expect in 5 Years (n=2,607)	
TOTAL	2,607	45	
Asia Pacific	807	50 🟢	EU, NA, SA
Europe	912	42 🔴	
North America	394	42	
South America	345	37 🔴	
Mid. East & Africa	120	Low Base	
China	418	52 🟢	UK, US
UK	272	43	
USA	365	42	

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP   Europe = EU   Mid. East & Africa = MEA   North America = NA   South America = SA   China = CH   UK = UK   USA = US

Dr = Doctors   Nu = Nurses

Question: D2. With regards to your expectations around patients and healthcare in the next 5 years, what proportion of…
(Average calculated from response bands.)

The critical element of trust in the patient-clinician partnership

As a result of this shift, 28% of clinicians globally consider managing real-time patient analytics from healthcare devices more effectively a priority for the next 2-3 years. Agreement is significantly higher in APAC (36%), specifically among doctors in China (47%). Conversely, significantly fewer UK (16%) and USA (22%) clinicians consider this a priority.

This growing significance of patient-controlled monitoring devices specifically and patient empowerment more generally has several implications, both for patients and clinicians.

One area of growing concern for patients around proactive health management is the proliferation of misinformation and even disinformation. The rise of wearables and, more broadly, proactive health management opens the door to influencers and self-labeled experts online who may not be providing reliable information or guidance. Misinformation can negate the benefits of patient empowerment, resulting in poor decisions that have negative outcomes.[14]

As we saw in the *Clinician of the Future Report 2022*, internet access is rebalancing the information asymmetry we have seen in the healthcare system for so long.[15] Providing accurate, reliable information is no longer enough to counter misinformation. Instead, clinicians and patients need to build a trusting and collaborative partnership, which could be facilitated by reliable digital health technologies.[16]

With this kind of foundational partnership in place, patients can also experience the full benefits of tools like wearables. For example, increased use of wearables has been shown to positively influence confidence and adherence to self-management of chronic conditions, depending on the level of health literacy.[17] More broadly, use of wearables can support patient empowerment, but this requires clinicians who are skilled in technology use and data analysis, as well as supportive of patients' use of the technology.[18]

Embracing hybrid communication

> "I'm concerned that the need to reduce healthcare costs and the desire from policy makers for everything to go digital is impacting patient care. Patients are no longer at the focus of healthcare."
>
> — Nurse (UK), 2023 survey

Patients are becoming more empowered, thanks in part to technology, and their proactive health management is likely to progress. In parallel, there is a shift to more digital solutions and modes of communication (see chapter 2 for details). This raises some concern about what contact between patients and clinicians will look like, and what that means for the partnership.

In-person contact is still most common today, but it is changing

Over three-quarters (76%) of current interactions with patients are in-person. There is some variation by region, but not much — it is lowest in the UK (69%) and highest in China (79%).

When asked to look forward five years, clinicians predict a significant drop in the proportion of face-to-face interactions they have with patients, to 64% globally. Again, this is lowest in the UK (53%) and highest in China (73%).

This pattern is mirrored in the amount of time clinicians report having with their patients. Interestingly, clinicians are least likely to report having sufficient time for good patient care in Europe (41%), where virtual meetings are more likely, and significantly more in Asia Pacific (75%), especially China (81%), where in-person meetings are more common. (See chapter 1 for details.)

The predicted reduction in face-to-face meetings comes with an expected increase in telehealth. While clinicians recognize that this could make healthcare more accessible for some patients, they also note that others, such as older or less tech-savvy patients, may have more difficulty. As we noted in the 2022 report, 64% of clinicians agreed the impact of health inequalities will be exacerbated by the greater use of digital health in the coming decade.[19] This is echoed in several verbatim responses from clinicians to the 2023 survey.

> "Accessibility, time savings, comfort, equity in patients with disabilities or with mobility limitations and perhaps greater adherence to treatments."

— Doctor (Colombia), 2023 survey

> "Many seniors have limited eyesight, hearing, use of hands (for typing) and limited access to computers, due to expense of hardware and internet access. Reliance on telehealth does not accommodate that population and relegates them to receiving no care, unless they have family/friends nearby to assist."

— Doctor (USA), 2023 survey

Patient centrality also came through in many of the priorities clinicians shared in the survey. Almost half of doctors (47%) identify better integration of patient health records as a priority to be addressed in the next 2-3 years and 44% of doctors prioritize adapting services to deliver personalized treatment approaches. Agreement is significantly higher among doctors in China, at 52% and 54% respectively.

Solution: data-informed partnership

> "Doctors need to have the time to listen to their patients and prescribe holistic care not just throw script after script [prescription] at them."

— Nurse (Australia), 2023 survey

Clinicians expect patients to be savvier, more aware and more proactive, and they need to be engaged together in their new relationship with the technology that will support their care. Technology plays a role in empowering both patient and clinician in this partnership.

The very basis is the technology itself: clinicians and patients need reliable technology and resulting data they can trust, in order to inform decisions and impact better patient outcomes. Patients need access to their health records, for example, and with growing focus on privacy and data security, they also want to control who sees and uses their information.[20, 21]

> "Patient empowerment is essential in such a health crisis. Empowerment requires both access to information and the tools and competence to make informed decisions." [22]

— Hägglund M. et al., BMJ

However, patient control of health data in particular may only be helpful with the support from clinicians to understand and act on that information. Conversely, clinicians need access to the data patients generate via wearables — and they need to be able to analyze, understand and apply it to clinical decision making.

This opens the path to shared decision making: a recommendation of the Patients Association and the Patient Information Forum (PIF).[23] According to research into the impact of digital tools on health outcomes via patient empowerment, tools need to be designed around the patient's real needs, and with the involvement of the patient and clinician.[24] Shared design and decision making throughout the care process will help extract the potential benefits of digital tools.

In the *Clinician of the Future Report 2022*, we envisioned a Future Clinician as a Partner for Health, who works in partnership with patients, making informed decisions based on reliable data.[25] We noted the need for upskilling (both clinicians and patients), and the challenge remains to ensure clinicians have the time to embrace the technologies that will facilitate their patient partnerships.

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Clinicians imagine a value-based future

Chapter 4

Clinicians imagine a value-based future

➤ 74% of clinicians think more should be done in preventive care, reflecting future VBC expectations

➤ 73% of clinicians expect that most patients will be managed in primary care settings

➤ 69% of clinicians expect hospital stays to be shorter

➤ 67% expect institutions to monitor patients' social determinants of health

➤ 51% of clinicians expect value-based care to lower costs

➤ 40% of clinicians rated personalized treatment as a top five priority

Overall, clinicians have a positive sentiment toward value-based care, with most expecting it to reduce burden on secondary care and improve the patient experience while saving costs. They recognize the importance of moving to a preventive and personalized approach, noting there is still a journey ahead, including improving preventive care. Although value-based care is not yet a broad reality in most countries, some are moving towards it, and clinicians generally see this positively.

In the *Clinician of the Future Report 2022*, we outlined some of the drivers of change in healthcare systems today. Population growth and aging were significant factors, identified by 93% of clinicians as key drivers of change. Correspondingly, 84% of clinicians in the prior study considered age-related diseases to make up the majority of patients' cases in a decade, and 71% predicted a rise in non-communicable disease (NCD) comorbidities among younger patients over the same time period.
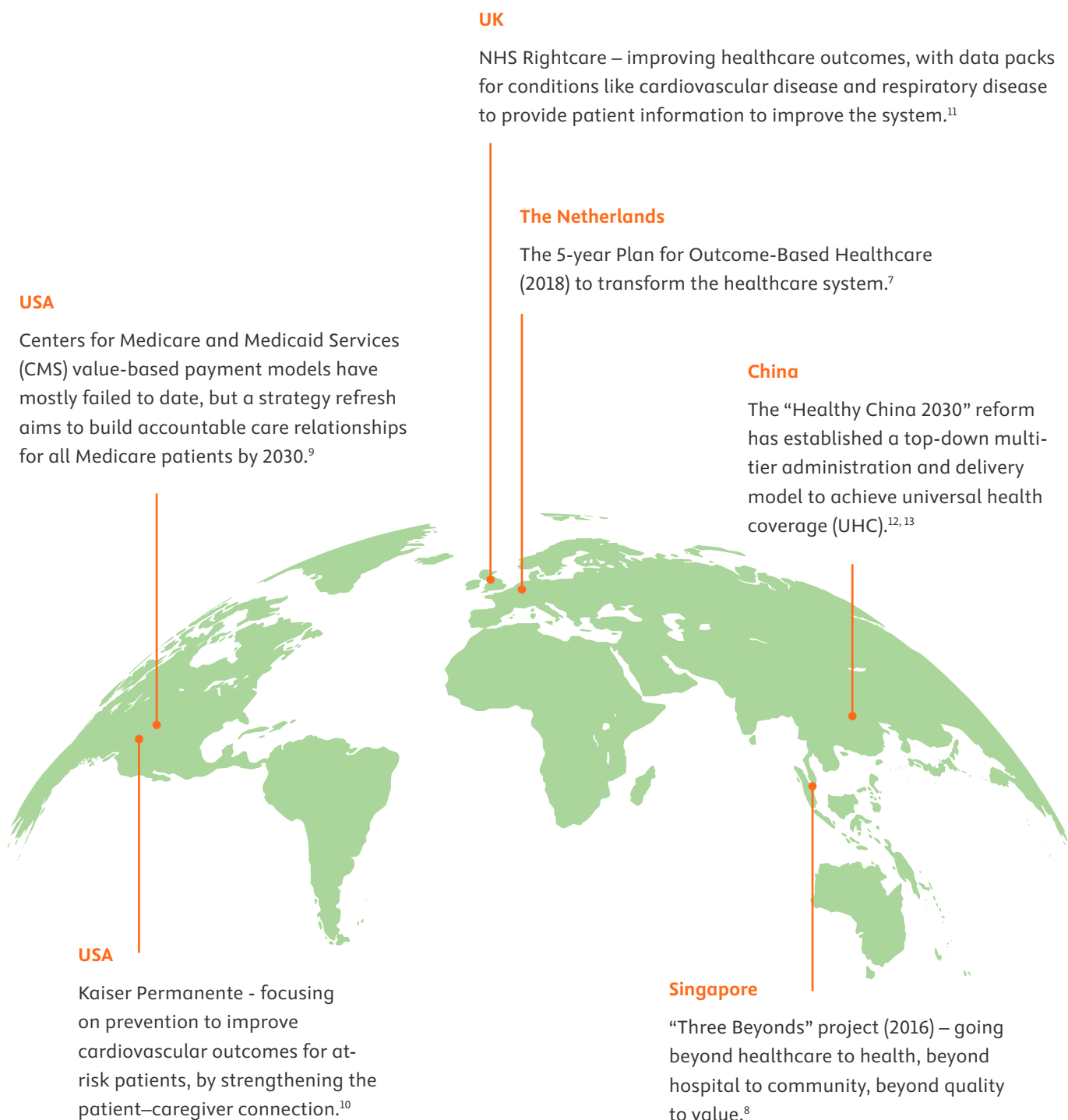
A year on, this situation continues to unfold and drive change in healthcare. According to the World Health Organization (WHO), the proportion of people aged over 60 will increase from 12% to 22% between 2015 and 2060.[1] This is especially the case in China, where 13.5% of the 164 million population is aged over 65 – a proportion set to double in the coming three decades.[2]

This accelerated population aging will have an impact on the prevalence of NCDs, making a new approach to healthcare even more urgent.[3] Added to that, the COVID-19 pandemic highlighted some of the ways value-based care could accelerate innovation and focus on maintaining health rather than treating sickness.[4,5]

As such, the concept of value-based care is gaining ground around the world, aiming to move away from a transactional pay-per-service approach to a more holistic, efficient, preventive and patient-centered one. A critical element of value-based healthcare is the patient's experience: an intervention can only be considered holistically valuable if the patient's need was met.[6]

Value-based care is defined in this report as a healthcare model in which providers, including hospitals and physicians, measure health outcomes against the cost of delivering the outcomes.

With a slowly progressing tide toward value-based care worldwide, some countries have accelerated beyond others with innovative models.

UK

NHS Rightcare – improving healthcare outcomes, with data packs for conditions like cardiovascular disease and respiratory disease to provide patient information to improve the system.[11]

The Netherlands

The 5-year Plan for Outcome-Based Healthcare (2018) to transform the healthcare system.[7]

USA

Centers for Medicare and Medicaid Services (CMS) value-based payment models have mostly failed to date, but a strategy refresh aims to build accountable care relationships for all Medicare patients by 2030.[9]

China

The "Healthy China 2030" reform has established a top-down multi-tier administration and delivery model to achieve universal health coverage (UHC).[12, 13]

USA

Kaiser Permanente - focusing on prevention to improve cardiovascular outcomes for at-risk patients, by strengthening the patient–caregiver connection.[10]

Singapore

"Three Beyonds" project (2016) – going beyond healthcare to health, beyond hospital to community, beyond quality to value.[8]
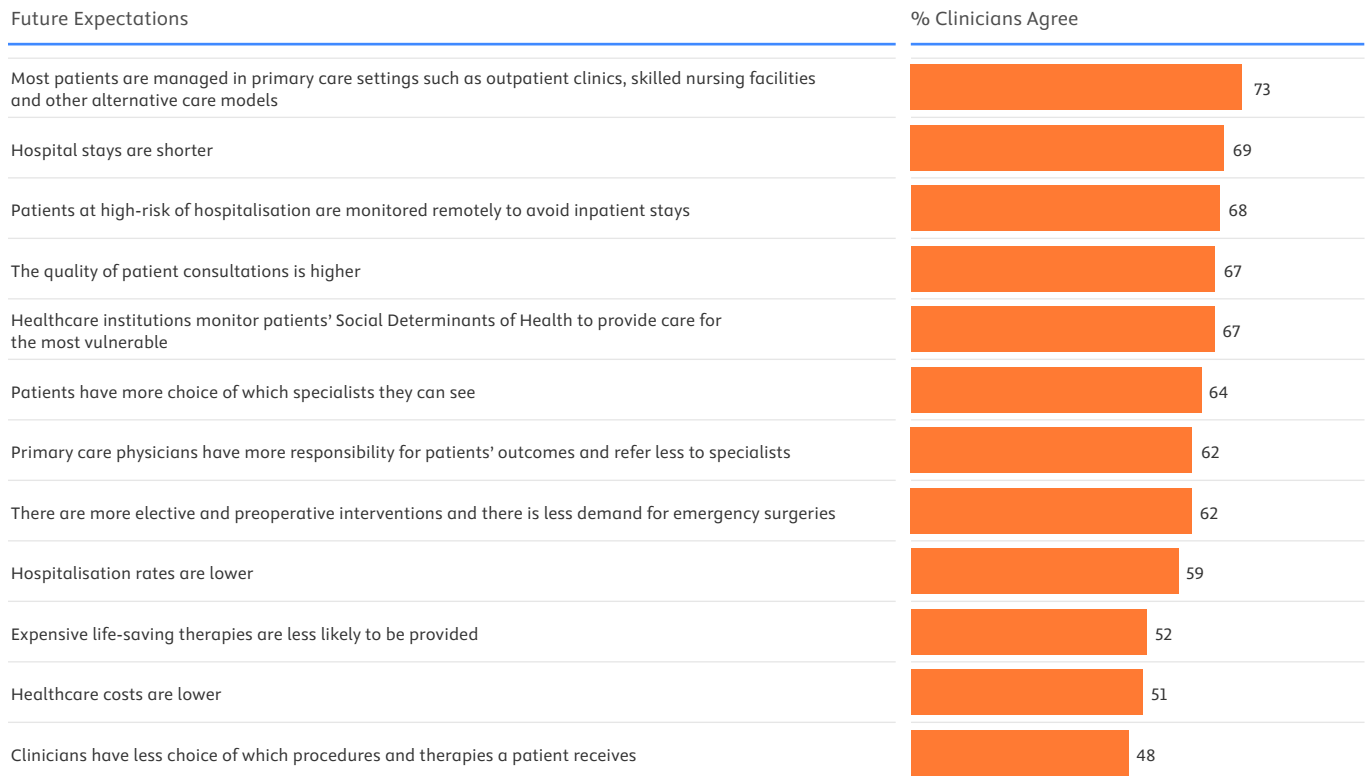
There are still many challenges to implementing value-based care successfully. Care management is a key component of value-based healthcare strategy, but as some have highlighted, there is as yet no patient-centered definition, and the concept of value can be amorphous and difficult to measure.[14] Although value-based models are showing some success for individual diseases, this moves away from the more effective (but more complicated to implement) patient-centered approach. There is also a risk of fragmentation from the patient's perspective, with many contact people at different organizations connected to their care.

Successful implementation of value-based care, at any scale, might require a more patient-centered approach with streamlined and holistic care management that meets their needs.[15] It would also require the engagement of the clinicians involved in patient care.

However, research suggests that many clinicians in the USA are wary of value-based healthcare: PwC reports that nearly two thirds of respondents to a survey they conducted believed it would negatively affect their practice. A similar proportion thought it would affect their earnings.[16]

We took the pulse of clinicians on value-based care to find out what their expectations are.

Future Expectations	% Clinicians Agree
Most patients are managed in primary care settings such as outpatient clinics, skilled nursing facilities and other alternative care models	73
Hospital stays are shorter	69
Patients at high-risk of hospitalisation are monitored remotely to avoid inpatient stays	68
The quality of patient consultations is higher	67
Healthcare institutions monitor patients' Social Determinants of Health to provide care for the most vulnerable	67
Patients have more choice of which specialists they can see	64
Primary care physicians have more responsibility for patients' outcomes and refer less to specialists	62
There are more elective and preoperative interventions and there is less demand for emergency surgeries	62
Hospitalisation rates are lower	59
Expensive life-saving therapies are less likely to be provided	52
Healthcare costs are lower	51
Clinicians have less choice of which procedures and therapies a patient receives	48

Question: D4. For each of the following statements, to what extent do you agree or disagree that you expect them to be a future impact of value-based care?

n=2,607

Incentivizing quality and efficiency

One of the biggest changes moving from a traditional healthcare structure to value-based care is the approach to payment. Value-based care changes the system from a fee-for-service (FFS) approach to one that favors smart spending, based on outcomes rather than services delivered.[17]

Considering the responses from clinicians in the 2022 Clinician of the Future survey, this shift would address some major frustrations. Most clinicians (68%) agreed there is too much focus on cost rather than care, particularly in North America (82%) and Europe (74%).

> "For-profit essential healthcare is the problem. It is delivered at 10 times the cost it should be."
>
> — Doctor (USA), 2023 survey

Half of clinicians think value-based care will lower costs

Globally, 51% of clinicians expect value-based care to lower costs. This expectation is highest in South America (56%) and Asia Pacific (57%), with 70% of clinicians in China expecting costs to fall.

Conversely, only 42% of clinicians in North America expect cost savings, with significantly fewer nurses (38%) and doctors (45%) agreeing in the region. Expectation is also significantly lower in Europe, at 44%.

Statement: Healthcare costs are lower

Region and Country	Base Sizes	% Clinicians Agree (n=2,607)		% Doctors Agree (n=1,950)		% Nurses Agree (n=657)	
TOTAL	2,607	51		53		49	
Asia Pacific	807	57 🟢	EU, NA	59 🟢	EU, NA	56 🔴	EU, NA
Europe	912	44 🔴		44 🔴		44	
North America	394	42 🔴		45 🔴		38 🔴	
South America	345	56 🟢	EU, NA	55	EU, NA	57	EU, NA
Mid. East & Africa	120	Low Base		53	EU	Low Base	
China	418	70 🟢	UK, US	72 🟢	UK, US	67 🟢	UK, US
UK	272	47		48		46	
USA	365	42 🔴		46 🔴		39 🔴	

🟢 🔴 Significantly higher or lower than total

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP   North America = NA   China = CH   Dr = Doctors
Europe = EU   South America = SA   UK = UK   Nu = Nurses
Mid. East & Africa = MEA   USA = US

Question: D4. For each of the following statements, to what extent do you agree or disagree that you expect them to be a future impact of value-based care?

Half of clinicians expect cheaper treatments provided in value-based care

Over half (52%) of clinicians expect cheaper treatments to be provided in a value-based healthcare system. This expectation is lower in Europe (42%) and higher in Asia Pacific (59%).

Agreement is more even as to whether value-based care will give clinicians less choice of which procedures and therapies a patient receives, with about half of clinicians agreeing. This is significantly lower in Europe (43%) and significantly higher in North America (55%).

> "Currently healthcare has become a business rather than a service to mankind. In the future, hospitals bills will soar."
>
> — Nurse (India), 2023 survey

Such a fundamental shift in the way healthcare is paid for comes with challenges. For example, in the 2022 'Survey of America's Physicians — Part Three,' 63% of respondents said measuring pay-for-performance was a challenge. They also pointed out challenges like electronic health records, with 85% pointing out the administrative burden involved for primary care.[18]

According to a report by McKinsey & Company, done right, the value-based care approach could provide an enterprise valuation of $1 trillion by 2027, profiting investors, payers and providers across the healthcare ecosystem.[19]

A new-look structure for a new system

The healthcare ecosystem could look quite different under a value-based care model. In the 2023 Clinician of the Future survey, clinicians expect, though not overwhelmingly, a greater focus on primary care, fewer, shorter and less costly hospital stays, and more choice for patients.

Clinicians expect a shift of focus to primary care in a value-based system

Under a value-based care system, 73% of clinicians expect that most patients will be managed in primary care settings such as outpatient clinics, skilled nursing facilities and other alternative care models. Agreement is most polarized in China, where 84% of doctors and 63% of nurses agreed.

> "Not enough money and resources are being invested in primary care, in particular primary care specialists (ie; General Practitioners, Family Medicine Doctors)."
>
> — Doctor (New Zealand), 2023 survey

Home care is an example of alternative model; currently only 35% of clinicians agree that healthcare systems today are well-equipped to deliver care at home. The picture varies greatly regionally: agreement ranged from over half of nurses in Asia Pacific (54%) to only 17% of doctors in South America.

> Only a quarter of clinicians in Europe and one-third in North America say today's healthcare systems are well-equipped for home care.

Given that 49% of clinicians in the 2022 survey agreed the majority of healthcare will be provided in a patient's home in 10 years' time, change is needed, and this is reflected in the priorities clinicians identified in the 2023 survey. When asked what their priorities are, 35% of clinicians agreed managing healthcare in patient's home instead of a healthcare setting (e.g. hospital or clinic) is important. This is significantly higher in Europe (42%) and lower in Asia Pacific (31%), reflecting views of the current system.

Clinicians expect to monitor high-risk patients remotely to avoid hospitalization

Most (68%) clinicians expect value-based care to involve using remote monitoring to reduce inpatient stays of high-risk patients. This expectation is highest in the USA (75%), particularly among US doctors (78%). It is lowest among doctors in the Middle East and Africa (59%).

Over half of clinicians expect fewer hospitalizations under value-based care

Clinicians do not overwhelmingly think hospitalization rates will fall, though 59% expect this to happen under a value-based care system. Expectation is higher among doctors (62%) than nurses (55%). And in China, clinicians (68%) are more likely to expect lower hospitalization rates, with 75% of doctors and 62% of nurses expecting this.

> Expectation of a lower rate of hospitalization was lowest among doctors in the UK (54%) and USA (56%).

Over two-thirds of clinicians expect shorter hospital stays under value-based care

However, clinicians are more optimistic that stays will be shorter, with 69% of clinicians globally expecting this. Expectation was lowest in South America (64%) and highest in the USA and UK (both 72%), particularly among nurses in the USA (77%).

Almost two-thirds expect less demand for emergency surgery

Globally, 62% of clinicians agreed there will be less demand for emergency surgeries and instead more elective and preoperative interventions under value-based healthcare. Agreement is significantly lower in North America (55%) in Europe (54%) particularly among UK doctors (52%).

Agreement is significantly higher in China (74%), and much higher again among doctors (82%) compared to nurses (67%).

Almost two-thirds expect responsibility to shift from specialists to primary care

Expectations around responsibility moving more towards primary care are less variable globally. Overall, 62% of clinicians think value-based care will give greater responsibility for patient outcomes to primary care doctors. Agreement is lowest in Europe (55%) and North America (53%), particularly nurses in North America and the USA (both 49%).

Significantly more clinicians in Asia Pacific (67%) and South America (68%) agreed.

Championing preventive care

> "We need to invest more in preventive medicine and less in pharmacological treatments. We need a more concerned society in the importance of keeping oneself in a good health, mentally and physically."

— Doctor (Spain), 2023 survey

Given the focus of value-based care on creating value by improving patient outcomes and saving cost, prevention is a more effective approach: it's about keeping healthy people healthy rather than treating people when they are sick.[20]

This was very much still the approach in the *Clinician of the Future Report 2022* – treating illness, not promoting health. The rise of the empowered patient emerged as a driving force toward value-based care, and clinicians envisioned a future more focused on prevention.

So where are we now? We took the pulse on prevention.

There has been progress on preventive care, but most say more work is needed

Globally, 74% of clinicians think more should be done in preventive care, with significantly more agreeing in South America (82%) and significantly fewer in Asia Pacific (70%) and among Middle East and Africa doctors (64%).

While agreement is high, it shows progress in the last year: in the 2022 Clinician of the Future survey, 80% of clinicians said more should be done on preventive care.

When we envisioned the future in 2022, 73% of clinicians globally identified that in 10 years' time managing public health would be a key priority in their role.

Statement: There is not enough being done on preventative care

Region and Country	Base Sizes	% Clinicians Agree (n=2,607)		2022 %	% Doctors Agree (n=1,950)		2022 %	% Nurses Agree (n=657)		2022 %
TOTAL	2,607	74 ▼		33	74 ▼		82	74		77
Asia Pacific	807	70 ● ▼		20	70 ● ▼		82	69		69
Europe	912	77 ▼	AP	45	76	AP	80	77	AP	85
North America	394	77 ▼	AP	50	77 ▼		84	77 ▼	AP	89
South America	345	82 ●	AP, EU	33	82 ● ▼	AP, EU, NA	90	82	AP	79
Mid. East & Africa	120	Low Base		0	64 ● ▼	NA	83	Low Base		0
China	418	73 ▼		14	71 ▼		80	75		80
UK	272	78		49	79	CH	79	77		79
USA	365	77 ▼		50	78 ▼	CH	85	77 ▼		89

● ● Significantly higher or lower than total

▲ ▼ Significantly higher or lower than 2022

Significantly higher than Role/ Region/ Country (indicated by first two letters e.g. AP = APAC)

Asia Pacific = AP North America = NA China = CH Dr = Doctors
Europe = EU South America = SA UK = UK Nu = Nurses
Mid. East & Africa = MEA USA = US

Question: B1. 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.

Public health is a top-five priority for nearly half of clinicians

Clinicians agree that managing public health is an important aspect of healthcare, with 46% of clinicians globally agreeing this is a priority. Agreement is significantly higher in South America (62%) and among Middle East and Africa doctors (59%) and significantly lower in Asia Pacific (39%), and China specifically (33%).

Although 56% of clinicians in the 2022 survey expected more mandated health check-ups in the next 10 years, there doesn't appear to be a big shift towards that. When considering the top five priorities of healthcare, clinicians focused on key areas such as addressing nursing shortages. In contrast, 26% of clinicians globally agreed mandated check-ups are a priority for the next 2-3 years. Agreement is significantly higher among nurses (29%) than doctors (23%). Mandated check-ups are higher priority for clinicians in China (33%) – particularly nurses (42%) – than in the UK (17%) or USA (16%).

Most clinicians (67%) expect healthcare institutions to monitor patients' social determinants of health (SDOH) as part of value-based care, to provide care for the most vulnerable. This is highest among Asia Pacific clinicians (73%), especially doctors in China (81%). Only 61% of clinicians agreed in the UK and USA, and agreement is lowest in Europe (57%).

| "Greater preventive work in primary care is necessary."

— Doctor (Guatemala), 2023 survey

| "Promote a culture of preventive medicine. Support the diagnostic and treatment research of diseases that most frequently affect the vulnerable population (TB, HIV…)"

— Doctor (Mexico), 2023 survey

Clinicians consider managing comorbidities among younger patients the least important of the priorities listed for the coming 2-3 years. However, opinion differed by location: in the UK (33%) and USA (38%) this was a bigger priority than in China (16%). Nurses in the USA are particularly concerned about this issue, with 43% considering it a top-5 priority in the near-term.

Solution: patient-centrality enabled by digital tools

Although value-based care is expected to shift the responsibility for managing care to the patient, views differ on whether the approach will give more choice to patients: while most doctors in China agree (78%), clinicians in the UK (49%) and USA (54%) are more doubtful. The disparity is greatest between doctors in China (83%) and the UK (36%).

Taking that a step further, personalized patient care is increasingly important. Globally, 40% of clinicians consider adapting services to deliver personalized treatment approaches a priority, with significantly more doctors (44%) than nurses (36%) agreeing. Clinicians in North America (46%) and the USA (47%) and doctors in China (54%) are most likely to prioritize personalized care.

Successful value-based healthcare puts the patient at the heart of their own care team. This means patient empowerment, mutual trust and strong patient-clinician partnership are vital aspects of value-based care.

Two-thirds of clinicians expect value-based care to result in an increase in the quality of their patient consultations. However, agreement is significantly lower in Europe (56%) and North America (57%), particularly among doctors in the UK (50%) and USA (51%). Conversely, significantly more clinicians in Asia Pacific (76%) expect higher-quality consultations in value-based care, with agreement highest in China (81%).

Digital technology enables value-based care

Digital technology plays an important role in putting the patient at the center of care. In the 2022 Clinician of the Future survey, clinicians believed telehealth is improving access and digital technology empowering patients. As the use of wearables continues to rise, and as AI becomes more applicable in diagnosis, treatment and interactions, the role of technology will expand.

➤ Facilitating preventive care: wearables help patients identify risks before they become symptoms and change their behavior to stay healthy.

➤ Remote monitoring: clinicians can use technology to monitor patients from a distance, keeping beds free and costs down.

➤ Tracking performance: patients can use digital tools to monitor, for example, adherence to treatment and symptoms, helping track outcomes.[21]

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Conclusion

Elsevier Health: Supporting the Clinician of the Future

In this 2023 report, we have revisited some of the trends in the *Clinician of the Future Report 2022* and put a spotlight on some emerging ones. Clinicians shared their experiences and views to help us elucidate the next step on our collective journey to the future of healthcare. We asked them to talk about their work today and their views on what might be coming 2-3 years in the future.

We recognize the challenges they face, and their concerns for the future, and we also see the opportunities there are to support clinicians as they navigate them. We conducted this 2023 survey to keep listening to clinicians, to hear their views and to see the world from their perspectives. With those insights, we can continue to develop solutions that help clinicians and their communities.

Solutions that address real challenges

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.

One year on from the original report, we are still taking action towards opportunity.

Empowering new nurses

Our Transition to Practice virtual learning platform helps new nurses build professional skills and confidence through a supportive new nurse orientation experience.

AI-powered 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.

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.

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, and as new clinicians enter the workforce, the landscape will continue to shift.
We want to keep listening to clinicians, including those on their way to qualification; our next step on this journey is a survey of students on AI and a number of other topics and we look forward to publicly sharing what we learn.

We invite you to share your thoughts and input with us.

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Clinician of the Future 2023

Methodology

This survey aimed to build on the 2022 Clinician of the Future study.[1] The objective was to take the pulse of attitudes and perceptions among healthcare professionals, in order to uncover the paradigm shifts expected to have maximum impact on the way healthcare is delivered in the future.
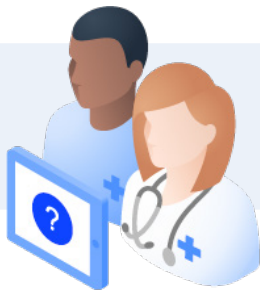
10-15-minute online survey

n=2,607 clinicians from 116 countries

April and May 2023

Who we surveyed

Respondents were a sample of clinicians (doctors and nurses in primary and secondary care) from a variety of sources, including:

➤ Clinicians who had published recently – these individuals were randomly selected from a database of published authors across 15,000 health titles (including journals and books) from various publishers

➤ Clinicians on a third-party panel provided by Dynata (voluntary sign up)

➤ Users of Elsevier solutions aimed at doctors and nurses (including ClinicalKey) and as well as sourced Elsevier's marketing databases

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 achieved a 0.6% response rate (including panel sample), and 1,781 people screened out as ineligible. In total, there were 2,607 surveys completed by clinicians across a range of disciplines and geographies. Please refer to the appendix (page 54) for a more detailed breakdown.

Results

We weighted the results based on OECD statistics data by region, and to equally represent doctors and nurses in the clinician totals. The following weighting was applied: Asia Pacific = 46%; Europe, Middle East and Africa = 29%; and NOAM/SA = 25%; plus an efficiency to ensure the total data included a ratio of 50:50 roles (doctor and nurse).

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 difference between groups, results are not necessarily generalizable to a whole country. Given the non-probability sampling methods, these tests are indicative.

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Acknowledgments

Clinician of the Future 2023

Appendix 1

Sample bases for reporting groups

Total (n=2,607)
Asia Pacific (n=807)
Europe (n=912)
North America (n=394)
South America (n=345)
Mid. East & Africa (not reported, low nurses)
China (n=418)
UK (n=272)
USA (n=365)

Role by market: Doctor (n=1,950)
Asia Pacific (n=564)
Europe (n=708)
North America (n=256)
South America (n=288)
Mid. East & Africa (n=120)
China (n=279)
UK (n=164)
USA (n=232)

Role by market: Nurses (n=657)
Asia Pacific (n=243)
Europe (n=204)
North America (n=138)
South America (n=57)
Mid. East & Africa (not reported, low nurses)
China (n=139)
UK (n=108)
USA (n=133)

Appendix 2

Sample bases by region/country

ASIA-PACIFIC (n=807)

	Base
Australia	32
Bangladesh	4
Brunei Darussalam	1
China	418
French Polynesia	1
Hong Kong	3
India	158
Indonesia	17
Japan	95
Malaysia	3
Myanmar	1
Nepal	2
New Zealand	5
Pakistan	12
Philippines	20
Samoa	1
Singapore	7
South Korea	6
Sri Lanka	5
Taiwan	12
Thailand	3
Vietnam	1

EUROPE (n=912)

	Base
Armenia	1
Austria	20
Belarus	2
Belgium	5
Croatia	4
Cyprus	1
Czech Republic	3
Denmark	2
Finland	2
France	76
Germany	181
Greece	7
Hungary	1
Ireland	5
Italy	33
Kazakhstan	1
Latvia	2
Lebanon	3
Luxembourg	2
Montenegro	1
Netherlands	4
Norway	1
Poland	5
Portugal	16
Romania	6
Russia	20
Serbia	3
Slovakia	2
Slovenia	1
Spain	189
Sweden	6
Switzerland	12
Turkey	22
Ukraine	1
United Kingdom	272

MID. EAST & AFRICA (N=132)

	Base
Angola	1
Bahrain	1
Burkina Faso	3
Cameroon	1
Comoros	1
Congo	1
Egypt	16
Ethiopia	2
Gambia	1
Ghana	3
Guinea	1
Iran	13
Iraq	5
Israel	6
Jordan	2
Kenya	1
Kuwait	2
Libya	2
Madagascar	2
Malawi	1
Mauritania	1
Morocco	2
Namibia	1
Nigeria	5
Oman	1
Qatar	3
Saudi Arabia	18
South Africa	4
Syria	2
Tunisia	4
Uganda	1
United Arab Emirates	14
Yemen	1
Zambia	1

NORTH AMERICA (n=394)

	Base
Canada	29
United States of America	365

SOUTH AMERICA (n=345)

	Base
Argentina	36
Aruba	1
Belize	1
Bolivia	3
Brazil	72
Chile	16
Colombia	24
Costa Rica	3
Cuba	10
Dominican Republic	6
Ecuador	17
El Salvador	2
Guadeloupe	1
Guatemala	7
Honduras	2
Jamaica	1
Mexico	92
Nicaragua	4
Panama	4
Peru	27
Uruguay	2
Venezuela	14

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