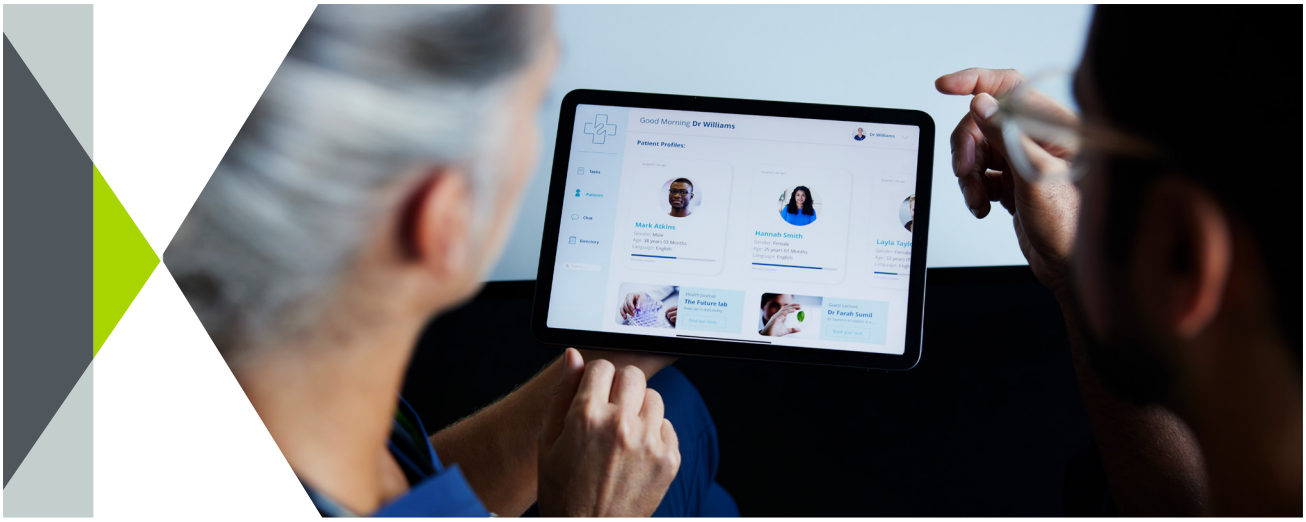


L.E.K. European Hospital Survey Series 2023 | Part 5 of 5

EXECUTIVE INSIGHTS

European Hospital Survey: The Future of Digital Health in European Hospitals

Executive summary

While the state of digital health of European hospitals varies widely within and across countries, hospitals are generally growing their investments in digital solutions that increase efficiency and productivity among short-staffed hospital teams and meet patient expectations of greater digital engagement post-COVID-19.

The UK, Netherlands and the Nordics have typically invested in digital hospital infrastructure to a greater extent and are more advanced than other European countries. In the UK, the National Health Service (NHS) has driven the majority of investments, aiming to improve efficiency, productivity and patient outcomes. Early funding programs run by NHS England aimed to support more widespread digitisation in hospitals, including the Digital Exemplar[1] and Digital Aspirant[2] programs. Additional digital health funding was put towards digitising integrated care systems (ICS), which partner multiple organisations involved in local care delivery and were established in 2022.

Germany lags other countries due to its historically low investment in digital hospital infrastructure. This was evident in the 2022 Healthcare Information and Management Systems Society's DigitalRadar survey, which in its interim report showed that only c.1% of German hospitals were rated in the upper levels (three or above) of the Electronic Medical Record Adoption Model scale of digital maturity,[3] and none were at the top levels of six and seven, indicating a significant lack of digital information systems in hospitals to support clinical care processes. Acknowledging the need to address this digital shortfall,

the German government launched the Hospital Future Fund (Krankenhauszukunftsfonds, or KHZF) in September 2020, providing up to 4.3 billion euros (co-funded by the federal government, federal states and hospital operators) to accelerate digital development.[4] Federal states submitted their applications for funding before the end of 2021, and the second Hospital Future Act (Krankenhauszukunftsgesetz, or KHZG) evaluation of the status of digitisation of hospitals receiving the funding is likely to happen in 2024.

French hospitals are also somewhat behind UK hospitals, despite gradually improving their digital maturity over the past c.10 years. In 2021, for example, the health minister announced a plan to invest 650 million euros towards the country's national digital health strategy.[5] Hospitals have been gradually modernising and integrating their systems, in part due to consolidation from the continued formation of regional hospital groups (Groupements Hospitaliers des Territoires) in the public sector and M&A in the private sector. The trend towards hospital digitisation is expected to continue, with some investments focusing on improving the inflow of patients from primary care, particularly for private hospitals looking to 'win' share of patients.

In this *Executive Insights*, L.E.K. Consulting discusses the state of digital health within European hospitals, including investment priorities going forward and implications for hospitals and their digital and IT suppliers. The data are informed by L.E.K.'s 2023 European Hospital Survey of hospital executives and directors in the UK, Germany, France, Spain and Poland covering the following areas of digital health (see Figure 1).

Figure 1

Digital health areas included in L.E.K.'s European Hospital Survey 2023

Category	Digital health area
Patient engagement	• Basic patient engagement tools (e.g. patient portals, same-day scheduling) • Advanced patient engagement tools (e.g. patient decision support, patient education, interactive patient communities)
Remote monitoring/virtual care	• Hospital-at-home programs leveraging digital tools (e.g. remote patient monitoring devices, data integration and AI supporting virtual care) • Remote patient monitoring for patients at home • Remote patient monitoring, within hospital or across hospitals • Telehealth and virtual care tools for patients at home • Telehealth and virtual care tools, within hospital or across hospitals
Clinical	• Enhanced core clinical systems (e.g. electronic medical/health records) • Hospital care delivery enhancement (e.g. AI for diagnostics, AI-based decision support for treatment and post-treatment decision making) • Surgical treatment enhancements (e.g. digital surgery, AR/VR visualization tools, surgical robotics tools) • Provider workflow (e.g. improved communication systems, clinical communication and collaboration solutions)
AI	• Digital capabilities to enable new data and AI business models (e.g. federated data platforms and/or data anonymisation for provision to third-party access) • Digital capabilities to improve access to/integration with AI marketplaces
Interoperability	• Interoperability and data management (e.g. health information exchange) — within hospital only • Interoperability and data management (e.g. health information exchange) — between hospitals of the same hospital group system • Harmonisation/integration of hospital IT tools across hospital group system
Architecture/infrastructure upgrades	• E.g. moving clinical systems to a cloud or hybrid cloud
Claims and revenue management	• E.g. data analysis to inform decision making, revenue cycle management, risk coding and adjustment

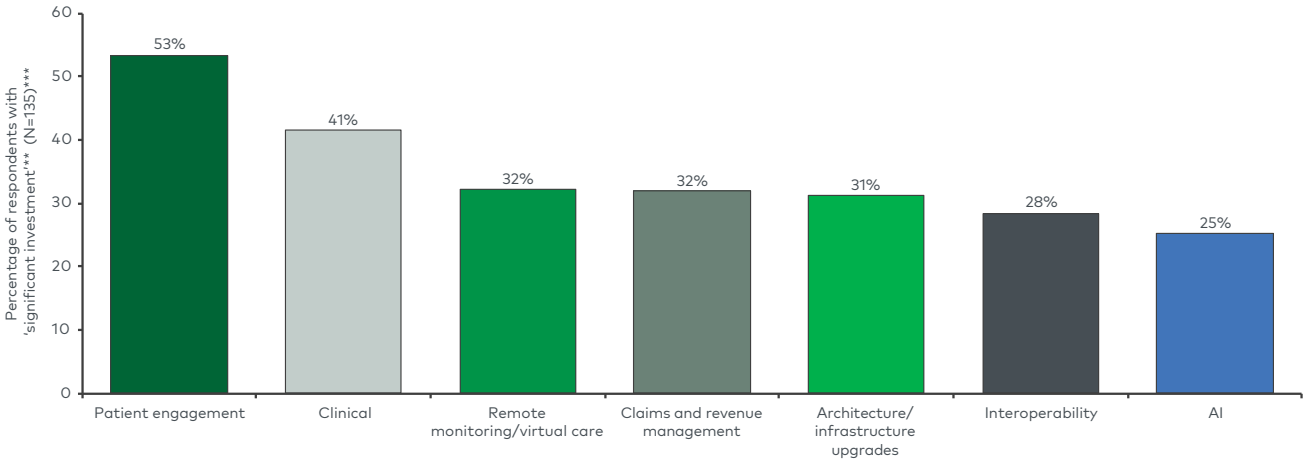
Note: AI=artificial intelligence; AR/VR=augmented reality/virtual reality
Source: L.E.K. 2023 European Hospital Survey

1. Digital health investments in the past three years concentrated on supporting and advancing patient engagement and clinical care

According to L.E.K.'s 2023 European Hospital Survey, hospitals have focused investments in the past three years on digital health solutions that support patient engagement and clinical care (see Figure 2).

Figure 2

Digital health investments in the past three years*



*Survey question: In which of the following areas has your hospital made digital health investments in the past 3 years (2019-2022)?
**Percentages represent the average of multiple investment areas within each category shown
***Respondents who selected 'I don't know' for any individual variable were excluded from the analysis (0-1 respondents per priority)Note: AI=artificial intelligence
Source: L.E.K. 2023 European Hospital Survey

Within the patient engagement category, basic (e.g. patient portals) and advanced (e.g. patient decision support) patient engagement tools are in the top five areas of significant past investments for almost all countries surveyed (except Germany, where these areas ranked sixth and ninth, respectively), partially driven by innovations and alternative methods of patient engagement developed during and following the COVID-19 pandemic.

Within the clinical category, enhancements to core clinical systems, such as electronic medical/health records (EMRs), have been a particular focus; this is one of the top five areas of past investment (based on the percentage of significant investment in the past three years) in Germany, France, Spain and Poland. While several UK NHS hospitals already have digitally advanced clinical systems, many UK hospital respondents note that only basic investments have been made in this area in recent years, and they are waiting for additional central NHS funding to further modernise their EMRs. The area of most significant investment in recent years is advanced patient engagement tools, followed by provider workflows.

There is some variation in historical levels of investment within these categories by country. For example, c.35% of respondents in the UK and Germany indicate there have been significant investments into interoperability (on average over multiple investment areas within that category) in the past three years, compared to only 15%-25% of respondents in other countries.

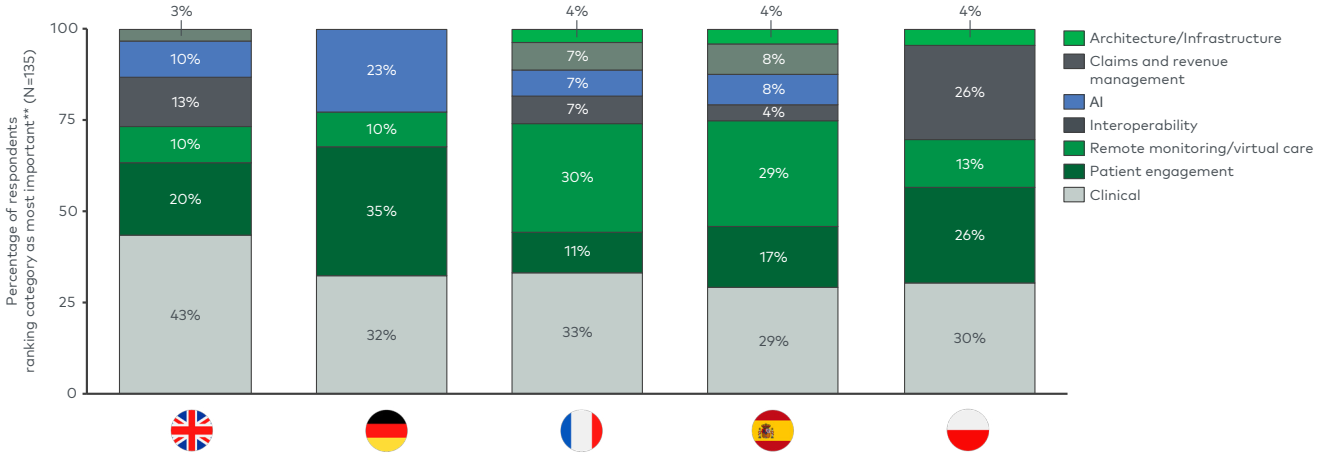
2. Clinical care, patient engagement and remote monitoring/virtual care will remain the three most important areas of digital health in the next three years

In the coming years, hospitals will remain focused on digitisation to improve clinical care, patient engagement and remote monitoring/virtual care, which together comprise the most important areas of digital health for 70%-75% of respondents across countries surveyed (see Figure 3). In addition, artificial intelligence (AI) and interoperability are expected to be key areas of digital health, which will support a broad range of hospital functions, including clinical care. The focus on AI is particularly evident in Germany, while the focus on interoperability is particularly evident in Poland.

Each of these areas of digital health will be discussed in more detail in the sections below.

Figure 3

Most important areas of digital health in the next three years*



*Survey question: Please indicate the three most important areas for your organisation when it comes to digital health in the next three years (2025)
**Sum of percentage of respondents ranking individual investment areas within each category as 'most important'
Note: AI=artificial intelligence
Source: L.E.K. 2023 European Hospital Survey

3. Hospitals are prioritising clinical digital health solutions to support productivity and clinical outcomes

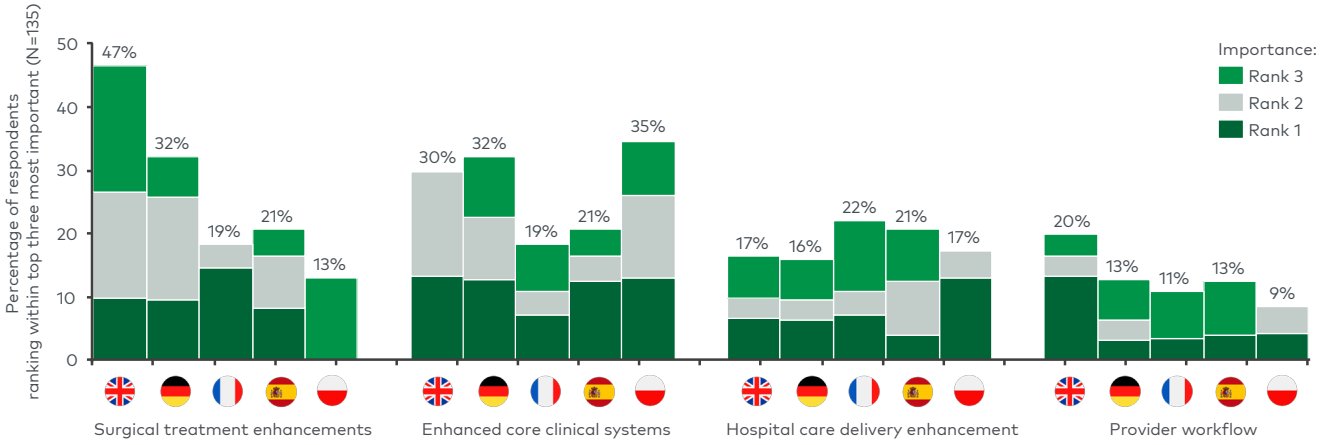
As discussed earlier, clinical applications are a key priority for EU hospitals, most notably enhanced core clinical systems (e.g. EMRs) (see Figure 4), which is within the top five most important (by percentage of respondents ranking it No. 1) areas of digital health in the next three years in all five countries. Clinical system IT infrastructure is still lacking in many European countries and is critical for hospitals to improve data security, quickly access and share patient records with patients and other clinicians, provide core clinical process support such as electronic order entry and closed-loop medication management, and ultimately improve staff productivity. Further investments in EMR systems are expected across Europe, including in more advanced markets such as the Nordics and the UK.

European hospitals are also seeing a growing interest in clinical digital solutions or tools that may directly improve clinical outcomes. For example, surgical treatment enhancements

(e.g. digital surgery, augmented reality/virtual reality (AR/VR) visualisation tools, surgical robotics tools) are among the top three priorities for c.45% of UK respondents and c.30% of German respondents. Surgical treatment enhancements may also enable increased productivity of surgical teams. This is particularly important for the UK, given the increasing importance of variable activity-based reimbursement (alongside fixed lump sums) to incentivise productivity and shorten waiting lists.[6] This means that hospitals completing more procedures per day will have access to greater funding, and thus digital solutions to enhance clinical productivity will be very important in the next few years.

Figure 4

Importance of digital clinical systems and tools in the next three years*



*Survey question: Please indicate the three most important areas for your organisation when it comes to digital health in the next 3 years (2025)
Source: L.E.K. 2023 European Hospital Survey

Digital health providers looking to become leaders in providing digital clinical support should ensure they are able to offer products or services that support hospitals in these key areas in the next three years.

4. Patient engagement tools are high priorities for many hospitals in the next three years

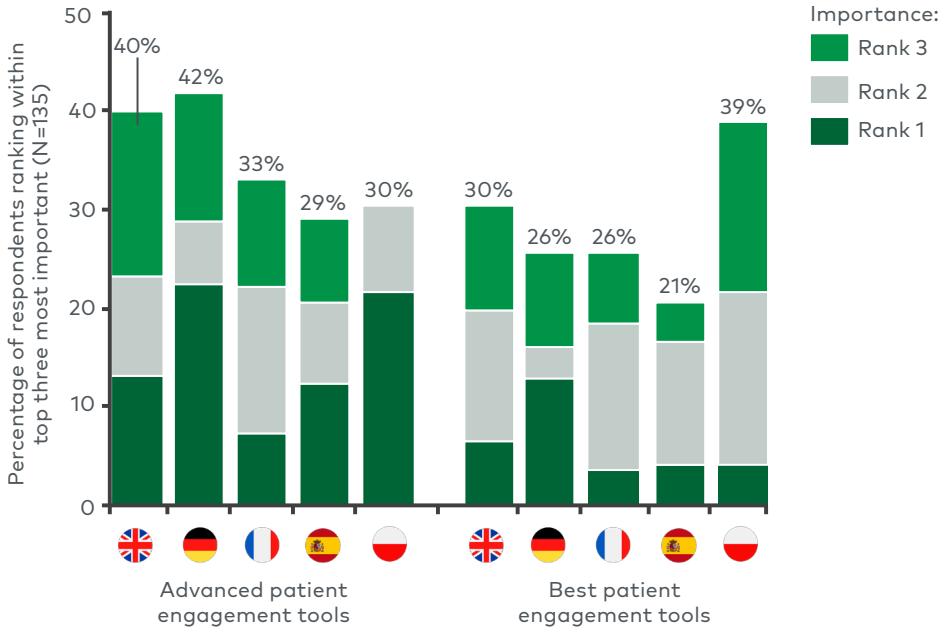
Patient engagement encompasses a variety of areas, from appointment-booking portals and education to admission systems, triage and discharge management. Some of these digital engagement tools take the form of mobile applications. For example, the NHS app has been downloaded by over 30 million users and facilitates booking appointments, ordering repeat prescriptions and accessing personal medical records.[7] DrDoctor, used by over 35 NHS trusts, is another example of an app-based digital engagement solution that allows patients to book their own follow-up appointments as needed rather than be booked automatically, resulting in shorter patient wait times[8] and fewer unnecessary appointments.

In L.E.K.'s 2023 European Hospital Survey, advanced (e.g. patient decision support, patient education and interactive patient communities) and basic (e.g. patient portals and same-day scheduling) patient engagement tools are rated in the top five most important digital

health areas to hospitals in all countries surveyed. Respondents in Germany show the greatest interest in advanced patient engagement tools, with over 40% of respondents ranking it within their top three most important areas of digital health in the next three years (see Figure 5). German hospitals are well positioned to explore the use of apps as engagement tools following Germany's successful introduction of the digital health apps (Digitale Gesundheitsanwendung, or DiGA) certification system in 2020, which allows for certification and subsequent reimbursement of applications prescribed by doctors to be used for various diagnoses.[9]

Figure 5

Importance of patient engagement tools in the next three years*



*Survey question: Please indicate the three most important areas for your organisation when it comes to digital healthin the next 3 years (2025)
Source: L.E.K. 2023 European Hospital Survey

5. In addition, remote monitoring/virtual care solutions will be important to increase the efficiency of overstretched medical teams and allow patients to return home sooner

The ability to reach patients digitally has opened the possibility of remote monitoring and virtual care, which have significantly expanded following the pandemic due to their potential to improve productivity (e.g. by running consultations virtually, reducing healthcare professional travel between wards and enabling patients to be sent home sooner).

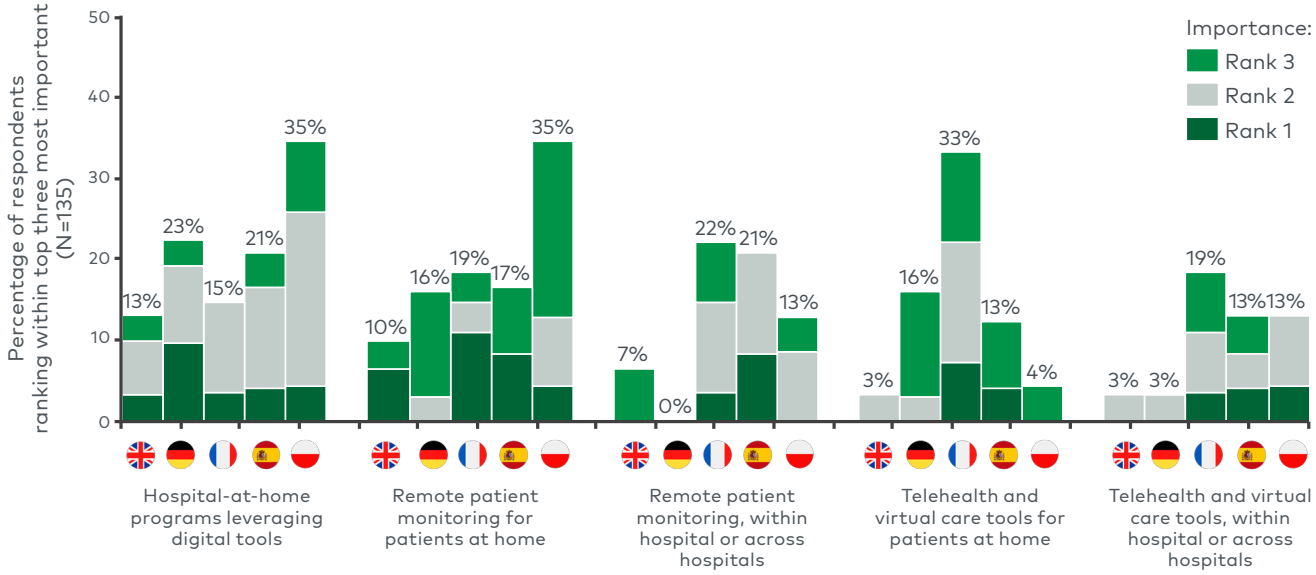
The UK, for example, is investing in virtual wards as an alternative to hospital care. The government recently announced its goal to treat 50,000 patients per month in this setting.[10] This is one part of NHS England's broader NHS @home program, which is exploring approaches to managing other conditions like blood pressure and heart failure at home.[11]

In L.E.K.'s 2023 European Hospital Survey, multiple categories of virtual care were considered, from hospital-at-home programs and remote monitoring to telehealth at home, within and

across different hospitals. Hospital-at-home programs and remote monitoring of patients at home generally ranked more important than the other types of remote monitoring and virtual care. This is particularly evident for respondents in Poland, c.35% of whom rate hospital-at-home programs and remote monitoring for patients at home in the top three most important areas of digital health (see Figure 6).

Figure 6

Importance of remote monitoring/virtual care in the next three years*



*Survey question: Please indicate the three most important areas for your organisation when it comes to digital health in the next 3 years (2025)
Source: L.E.K. 2023 European Hospital Survey

In France, there is a somewhat greater emphasis on the future use of remote monitoring and virtual care than in other countries, particularly for remote patient monitoring within and across hospitals and for remote monitoring and virtual care tools for patients at home. The reimbursement system has been updated to encourage use of these capabilities, as teleconsultations have been fully reimbursed by the French Social Security since 2020 and fees for teleconsultations and in-person visits are the same.[12]

6. Interoperability within and between hospitals allows hospitals to better leverage data and analytics to boost clinical and operational performance

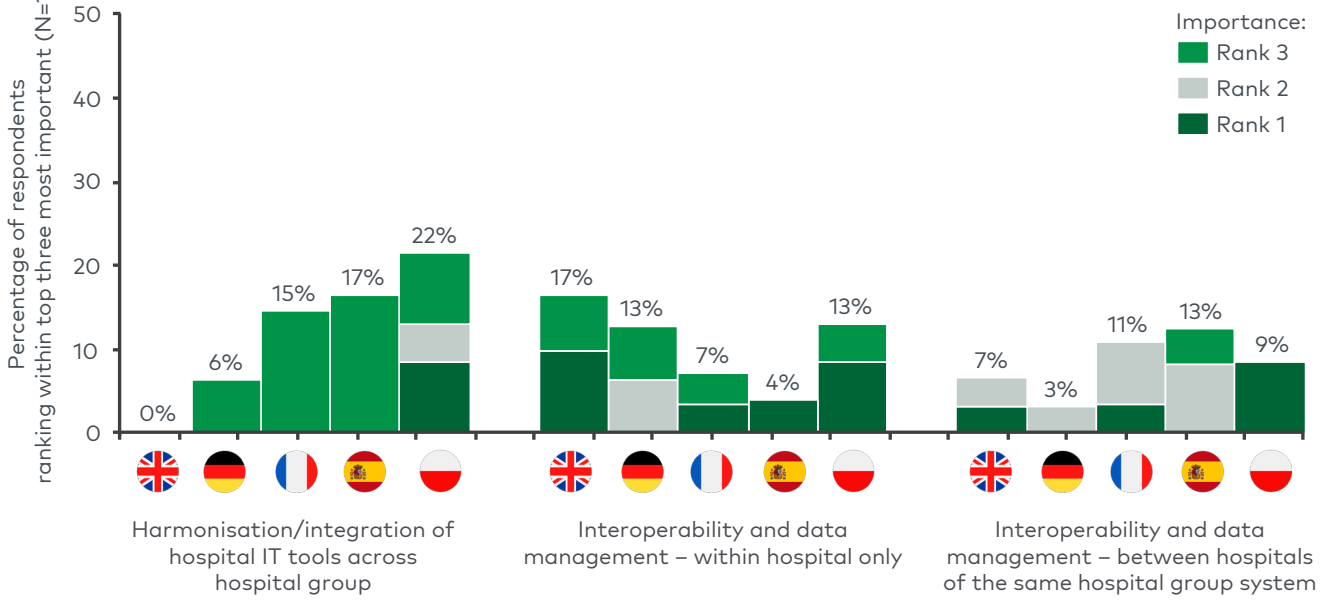
Data interoperability is increasingly important for hospitals to carry out essential functions and efficiently access patient data across departments or hospitals. Improving data interoperability will underpin the adoption of more advanced data and analytics/AI technologies, enabling the use of large patient data sets from different hospitals to inform treatment decisions and the use of operational/workflow data to optimise the efficiency of processes.

In L.E.K.'s 2023 European Hospital Survey, interoperability of data within hospitals was considered a top three area of digital health by a greater proportion of respondents in the UK, Germany and Poland (see Figure 7). In the UK, 17% of respondents rank this within

their top three most important future areas of digital health. In line with this, NHS England recently announced its intent to build a federated data platform to allow for the sharing of information between individual hospital trusts and integrated care systems (ICS).[13]

Figure 7

Importance of data interoperability in the next three years*



*Survey question: Please indicate the three most important areas for your organisation when it comes to digital health in the next 3 years (2025)
Source: L.E.K. 2023 European Hospital Survey

7. The interest in using AI is growing, albeit not uniformly, with several hospitals exploring new business models around data access provisioning

AI is increasingly being explored for use in healthcare settings, including by hospitals. The UK and the Nordic countries are advanced relative to others in this area, with some examples of AI adoption in, for example, treatment predictions, imaging and diagnostics that improve hospital care delivery, and the management of waiting lists.

Imaging was one of the first experimental application areas for AI in hospitals, but many solutions are now quite mature. For example, RapidAI, a leading solution for stroke care decision support, is running in more than 2,000 hospitals and is approved in over 100 countries. There is also emerging AI imaging software that has received approval to operate without human intervention. Oxipit became the first company to receive a CE mark in Europe for a fully autonomous AI medical imaging product, Chestlink,[14] which can send notices to patients directly following a medical check-up.

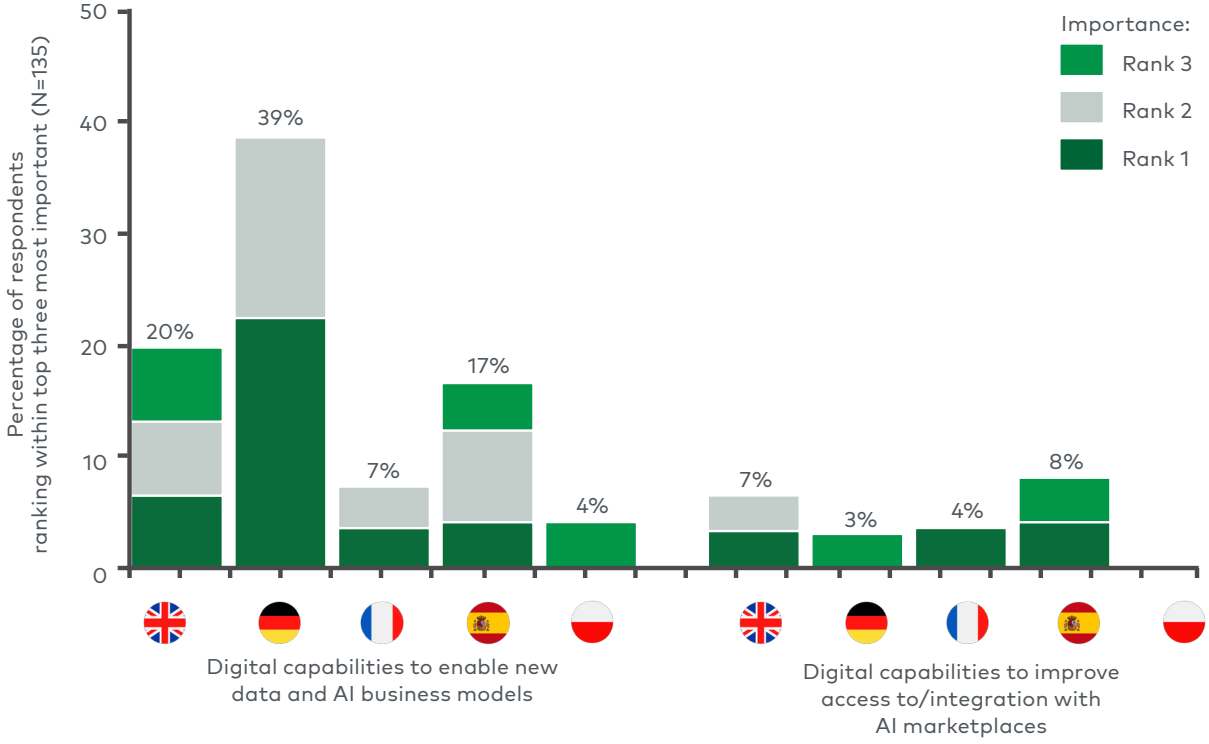
The UK is also exploring the use of AI in a wider range of applications, and NHS England has established the NHS AI Lab to facilitate advancements and adoption of AI technologies through collaboration among government, providers, academics and technology companies. Its AI in Health and Care Award offered £123 million to accelerate the development

of AI-based technologies.[15] Another UK initiative related to AI is the London Medical Imaging & AI Centre for Value Based Healthcare; the consortium, led by King's College and Guy's and St Thomas' NHS Foundation Trust and including 10 other NHS trusts and several universities and industry partners, aims to build AI algorithms for the diagnosis and treatment of several types of diseases and has also developed platforms for AI deployment and federated learning/data access.[16]

In parallel with improving patient experience and clinical outcomes, L.E.K.'s 2023 European Hospital Survey highlights that some hospitals are also interested in using AI and data to explore new business models. Respondents in Germany show the greatest interest in this area; c.40% rate this in their top three most important areas of digital health in the next three years (see Figure 8).

Figure 8

Importance of AI in the next three years*



*Survey question: Please indicate the three most important areas for your organisation when it comes to digital health in the next 3 years (2025)
Note: AI=artificial intelligence
Source: L.E.K. 2023 European Hospital Survey

There are two key application areas for hospital data. The first is the development of new AI solutions trained on this data, and the second is the more traditional use of the data in new drug and new product development for pharma and medtech companies, respectively. Hospitals looking to monetize their data for these purposes can leverage different levels of patient privacy by sharing data access (a) with patient consent, (b) in anonymised form and (c) with federated data access. The last enables the algorithm or analytics question to be deployed in the hospital system and to access the data there in secure fashion, without the individual data sets being shared with a third party.

In addition to providing data access for third-party AI companies, another option for healthcare providers, large universities and research hospitals to generate new revenue streams can be to invest in creating an innovation centre to fund internally developed AI technologies with the potential to be commercialised later. Diaverum, a leading provider of dialysis care, for example, recently developed an AI model that enables the prediction of thrombosis events in patients several days before they occur.[17]

Obviously, data monetisation and the use of large data sets rely on the interoperability of data between institutions and different clinical systems to allow multiple data sources to be combined. This will therefore be an important function for hospitals to continue to advance in parallel with their aspirations to explore AI and data analytics over the coming years.

Conclusion

L.E.K.'s 2023 European Hospital Survey highlights how hospitals are continuing to focus on digital health in clinical care, patient engagement and virtual care in the next three years, and how some are also prioritising investments in AI and in data strategy and architecture. Hospitals should carefully consider their future digital strategy, work with digital providers to improve capabilities in areas with the greatest need and continue delivering increasingly high-quality patient care.

Digital health companies and hospital suppliers should ensure they are tailoring their offerings and marketing strategies towards key areas of hospital need to successfully compete and differentiate themselves as leading suppliers within this growing market space.

To discuss the findings of this survey in more detail, please contact Klaus Boehncke **k.boehncke@lek.com**, Jean-Guillaume Bayada **jg.bayada@lek.com** or Guillaume Duparc **g.duparc@lek.com**.

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Related *Executive Insights* from the European Hospital Survey 2023

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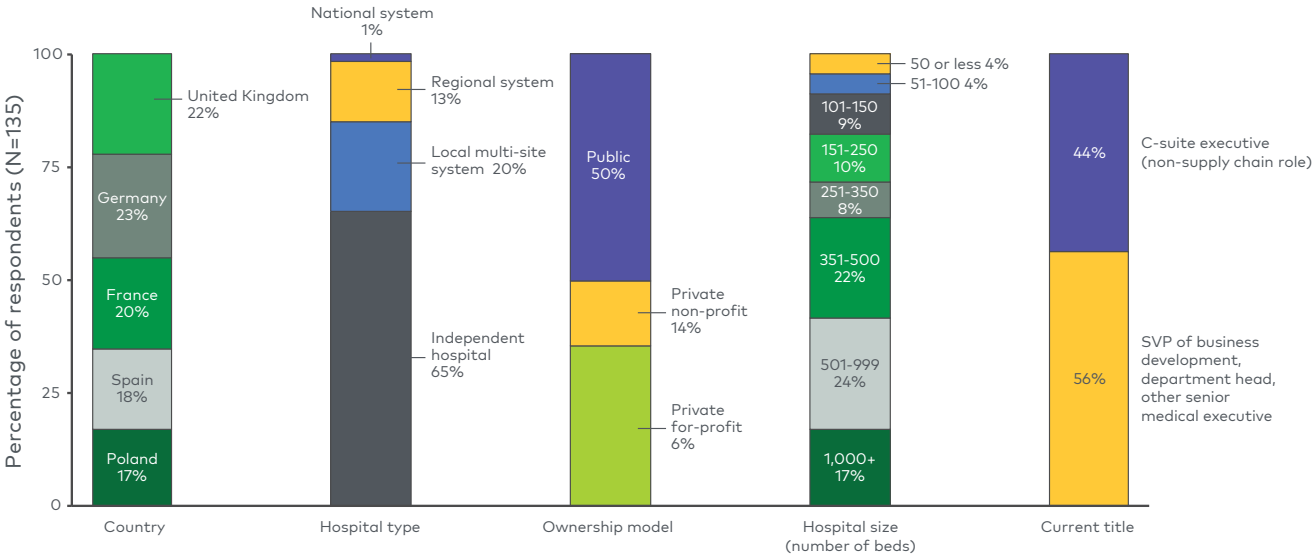
European Hospital Survey: Strategic, Operational, and Clinical Care Trends in France

Appendix: Background and methodology

L.E.K. Consulting conducted an online survey on the views of over 300 hospital executives and directors of public- and private-sector hospitals in the UK, Germany, France, Spain and Poland, which was fielded from October through December 2022 (see Figures 9 and 10). A subset of 135 respondents who are C-suite executives (excluding supply chain roles), senior vice presidents (SVPs) of business development, department heads and other senior medical executives were considered in this *Executive Insights*.

Figure 9

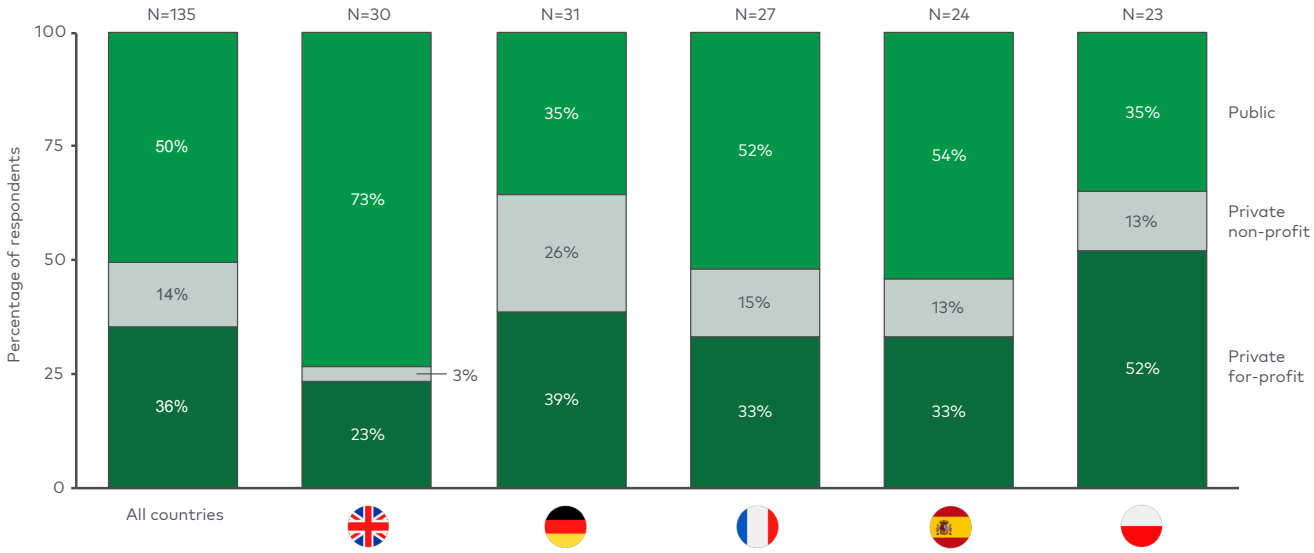
European hospital survey respondent mix*



*Only respondents working primarily in hospitals or hospital groups are included; those working in outpatient settings, nursing facilities or primary care were not included
Note: SVP=senior vice president
Source: L.E.K. 2023 European Hospital Survey

Figure 10

Respondent hospital ownership model mix by country*



*Only respondents working primarily in hospitals or hospital groups are included; those working in outpatient settings, nursing facilities or primary care were not included
Source: L.E.K. 2023 European Hospital Survey

Responses for individual countries reflect the above hospital ownership model mix. There was no weighting/rebalancing of responses by any of the above demographics.

Endnotes

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