Global Policy Network

# Global Medicines Policy Series 2025

# The Future of Pharmacy-Innovation, Integration and Impact: A Policy Brief

## Health System: United Kingdom

info@globalpolicynetwork.com
www.globalpolicyetwork.com

# The Future of Pharmacy: Innovation, Integration, and Impact

## Executive Summary

The policy report summarises insights and recommendations from the Global Policy Network's United Kingdom (UK) Medicines Policy Series roundtable held on 24 September 2025. The session, titled “The Future of Pharmacy: Innovation, Integration, and Impact,” brought together senior pharmacy and academic leaders to discuss pharmacy’s transformation across strategic commissioning, genomic-informed care, and digital and workforce development.

Pharmacy must evolve from transactional, activity-based roles to become a strategic partner embedded within integrated care systems and neighbourhood health models. However, systemic operational barriers currently constrain this transformation. The 2026 mandate for all newly qualified pharmacists to become Independent Prescribers (IP) presents significant implementation challenges, particularly the absence of funded supervision for trainees and inadequate curriculum adaptation to prepare graduates for prescribing responsibilities. Similarly, integrating pharmacogenomics and Artificial Intelligence (AI) into routine practice requires robust governance frameworks while addressing persistent gaps in workforce digital literacy and ensuring equitable access across populations.

This report identifies six critical insights and sets out actionable recommendations for National Health Service (NHS) England, Department of Health and Social Care (DHSC), Integrated Care Boards (ICBs), professional bodies, and education partners.

## Introduction

The global pharmacy practice has been characterised, for decades, by its role in dispensing and verification of medications (Atkinson, 2022). Nevertheless, in recent

times, the profession has undergone a profound transformation that reaches far beyond the traditional confines of the dispensary counter. This shift is made possible by an ever-fast-paced evolving landscape, actively backed by technology and an ever-shifting socio-cultural expectations (Martini et al. 2024; Atkinson 2022). The integration of AI, pharmacogenomic precision medicine, digital health technologies, and expanded clinical roles for pharmacists is fundamentally reshaping how medications are discovered, prescribed, optimised, and monitored. Simultaneously, healthcare systems worldwide face mounting pressures: ageing populations with multimorbidity, escalating medication-related adverse events, increasing healthcare costs, constrained health budgets, and burgeoning antimicrobial resistance (Martini et al. 2024). These convergent forces create both imperatives and opportunities for pharmacy to evolve from a transactional, dispensary-focused profession to one that is strategically embedded in the clinical and preventive heart of healthcare delivery.

To explore how that change can be delivered in practice, the Global Policy Network convened Roundtable Four of the UK Medicines Policy Series on 24 September 2025. Senior leaders from the NHS, academia, community pharmacy, and industry examined three linked questions:

1. How should commissioning and measurement evolve to reward system value from medicines and services?
2. Where does pharmacogenomics add real-world benefits that commissioners can afford and scale?
3. What digital and workforce foundations are required for safe implementation, including interoperable Electronic Prescribing and Medicines Administration (EPMA), a usable single medicines record, decision support governance, protected learning time, and funded supervision for prescribers and technicians?

The brief summarises the challenges raised, distils the key insights and sets out practical recommendations for national, regional and professional stakeholders.

# Persistent Challenges

## 1. Challenges with Transactional Models of Contracting

### *Fragmented and siloed service delivery*

Persistent challenges due to transactional contracting involves a narrow focus on individual health and the discrete exchange of pharmaceutical goods and/or services; rather than long-term, more holistic and relational arrangements (Clark et al. 2012; The Pharmaceutical Technology Editors, 2007). The emphasis is on completing immediate transactions efficiently instead of building broader strategic partnerships. For instance, one of the features of the UK pharmacy workforce, according to one of the panellists is having:

*"…large teams of people who are effectively providers…".* (Chief Pharmacist)

This remark indicated that large teams carry out similar tasks, which hinders opportunities for innovative collaboration. There also appears to be a lack of system-thinking, resulting in fragmented delivery as individual teams work in silos.

### *Overprescribing and Polypharmacy*

The concept of polypharmacy and overprescribing also persists due to the way patients are reviewed. As a participant noted:

*"We do a destructive medication review on the patient. Patient then goes into hospital and comes back out on five more medicines."* (Chief Pharmacist)

This "destructive" review process highlights a fragmented care pathway where initial assessments tend to fail to prevent escalation, leading to additive prescribing rather than rationalisation. Transactional models can worsen this situation by prioritising episodic interventions over coordinated, longitudinal management, resulting in cumulative medication burdens that heighten polypharmacy-related risks. In the pharmacy context, these patterns undermine efforts toward evidence-based pharmacotherapy, particularly for vulnerable populations where a holistic review could mitigate these effects. These reviews must also consider unique population groups,

particularly the ageing population with multiple chronic conditions. In this case, medicine optimisation is essential. As such, depending on the findings of case-by-case review, adding or reducing medications (deprescribing) may be appropriate.

### *Narrow View of Service Delivery*

Similarly to monotonous workforce, there is also the monotonous way of thinking about service delivery. For instance, in terms of preventive services, as a panellist opined,

*"There's an awful lot of prevention happening already; although I think actually, perhaps the pharmacists, we are in danger of thinking that prevention is all about medicines, whereas it's obviously much, much more than that".* (Chief Pharmacist)

This narrow pharmacological lens restricts preventive strategies to medication-centric interventions, overlooking broader determinants like lifestyle modifications and environmental factors essential for holistic population health. Transactional contracting reinforces this myopic approach by incentivising discrete pharmaceutical outputs over integrated, multi-domain programmes, such as the national neighbourhood programme, that foster sustainable health behaviours. Consequently, pharmacy services risk missing opportunities for comprehensive and integrated prevention approaches, perpetuating inefficiencies in resource allocation and limiting impact on population-level outcomes. Therefore, it is essential to think critically about the roles of medicines and pharmacy in programmes outside hospital settings, and work towards a more integrated care approach.

### *Sub-optimal service delivery for chronic conditions*

Additionally, most health services are provided in hospitals, which generally leads to one-off engagement. While this is optimal in instances of acute and short-term disease, it hinders care for chronic and long-term conditions. Since transactional contracting does not encourage long-term engagements (Clark et al. 2012), chronic conditions may not be well managed. These types of care are best suited out of the hospital, and best *"fits into neighbourhood health where you're thinking about all the non-pharmacological treatments, working with neighbourhoods, working with*

*voluntary organisations, local authorities around the prevention agenda*". (Chief Pharmacist)

### *The challenge of high-cost, low-volume case mix*

Based on the above-mentioned challenges, the cost-of-service delivery is rarely optimised. The lack of active collaboration has considerable increased risks of encountering *high-cost, low-volume case mix*. This phenomenon reflects a situation where a small proportion of services consumes a disproportionately large share of overall costs (Mehmood et al. 2021). This point is highlighted by one of the panellists,

*"... in the hospitals, there's a much more high-cost, low-volume case mix. But... there's no point in the hospital doing something that saves them money if it costs more overall."* (Chief Pharmacist)

This points to the need for stronger collaboration and system-thinking ensuring cost saving measures in one part of the system do not create higher cost elsewhere.

## 2. Digital Integration, Interoperability and AI Governance

The shift from analogue to digital is one of the three fundamental pillars of the UK Government's 10-year Health Plan (NHS, 2025), it represents a profound transformation of how the NHS operates, delivers care and manages information.

### *Lack of standardised EPMA Systems*

Participants discussed the use of EPMA systems and their potential to drive innovation and enhance the impact of community pharmacies. However, they expressed significant concerns about the implementation and the lack of standardisation across EPMA systems. While Scotland has successfully implemented a unified EPMA system across all trusts, English trusts operate independently. This has resulted in a fragmented digital landscape, with varying systems and levels of implementation among NHS England Trusts (Ahmed et al, 2016).

*"It would be nice if trusts that have EPMA, rather than pushing and getting more*

*funding and going for things, like kind of more enhanced status, could support the other trusts."* (Lead Pharmacist in Workforce Development)

The deployment and maintenance of EPMA systems require substantial investment in digital infrastructure and staff training. Some trusts may not have the necessary financial and human resources to effectively roll out and support these systems.

## *Interoperability Between Systems*

The integration and impact of pharmacy in the care sector is limited by the lack of interoperability between EPMA systems. Patient records are not shared across care settings including community pharmacies, general practitioners and hospitals, leading to inefficient patient care, which increases the chances of miscommunication during the patient's journey (Heney et al, 2023). The discussion highlighted current barriers in interoperability, that affect care delivery and collaboration:

*"At the moment, interoperability and informatics is a major barrier in the NHS."* (Clinical Pharmacy Lead)

Another attendee highlighted:

*"I think a few people have already mentioned that the shift to EPMAs and how difficult it is to just have an EPMA in place. And then the next level is to make those EPMAs talk to each other and having that single patient record that the NHS wants to move towards."* (Clinical Pharmacy Lead)

In many regions of the UK, community pharmacists face significant challenges due to their inability to access patient records. Healthcare providers often remain unaware of what occurs in other sectors, which disrupts the continuity of care for patients. As a result, patient journeys become fragmented, making it challenging for the healthcare professionals involved to fully understand and manage patients' needs at each step of the process (Heney et al, 2023). This lack of seamless communication and access to information prevents pharmacists from operating at the fullest extent of their qualifications, negatively impacting the quality of care that patients receive.

## *Digital Literacy as a Barrier to Digital Integration*

The lack of digital literacy among the pharmacy workforce is hindering the potential innovations and impacts outlined in the NHS 10-Year Plan. The successful integration of AI and digital systems into the healthcare sector depends on the workforce being educated about these technologies and knowing how to use them. However, the pharmacy workforce is currently struggling with digital literacy, therefore even with the right systems in place, the workforce would be unable to utilise them effectively. Digital solutions are only as effective as their integration with existing systems.

An attendee mentioned:

*"We've also got lots of issues around current digital solutions and the ability for NHS employees to use them."* (Chief Pharmacist)

This point is further reinforced by another attendee:

*"With the NHS plan and the changing in roles of pharmacists and pharmacy technicians and these expanded clinical responsibilities, that pharmacists need to be more digital literate and be able to use AI."* (Head of Pharmacy)

## *AI Governance*

Despite the current challenges that digital systems pose for the healthcare workforce in the UK, the NHS 10-Year Health Plan identifies AI as an innovative and central pillar for enabling the NHS system (NHS, 2025). However, multiple attendees at the roundtable discussion expressed their concerns and scepticism regarding this approach. They emphasised the need for caution against over-reliance on AI and the importance of setting realistic expectations about what AI can achieve in pharmacy and the wider NHS. It should be viewed as a tool that addresses real-world challenges rather than as a universal solution.

*"People just talk about AI as being the solution to every problem."* (Chief Pharmacist)

## 3. Genomics and Pharmacogenomics in Practice

Genomics and pharmacogenomics offer transformative potential for healthcare delivery through personalised medicine based on genetic profiles. However, despite its promising potential, healthcare professionals have raised concerns about its implementation (Rafi, et al, 2020). Roundtable participants emphasised that the buildup is tempered with scepticism, as one speaker noted:

*"Just like AI, genomics will save everyone and the universe, and everything will be great. However, there are a lot of challenges that we have to overcome and implementation barriers in order to get there."* (Chief Pharmacist)

### *Affordability of genomics and translating evidence into value*

Economic evaluations conducted in studies on pharmacogenomics demonstrate that its implementation leads to improved patient care at a reasonable cost. This approach not only enhances clinical outcomes but also proves to be either cost-effective or cost-saving across a range of healthcare systems (Apellaniz-Ruiz et al., 2024). However, challenges remain in regard to short-term affordability and workforce capacity remain significant hurdles.

"*There is an issue around affordability, particularly in the short term."* (Chief Pharmacist)

The fundamental challenge lies in translating statistical evidence into financial impact for commissioning decisions. As one speaker articulated:

"One o*f the problems that we have with genomics is that the value of genomics can be seen as the statistics around it, the statistics of the evidence base that by doing a test and changing the line of treatment or optimising dose, you're statistically going to prevent some safety issue or some ADR, or improve efficacy. But that's really hard to translate into money in the real world."* (Clinical Pharmacy Lead)

## *Digital challenges to the integration of genomics*

The current digital fragmentation within the NHS system, including EPMA systems, makes integrating genomic data and clinical decision support difficult. Genomics relies on comprehensive and up-to-date data to optimise medicine and provide personalised care. This data must be accessible at the point of care, allowing clinicians to make informed decisions about which medications to prescribe and the appropriate doses for each patient. However, the lack of interoperability across UK EPMA systems complicates this process.

*"If I'm about to prescribe a drug that requires a pharmacogenetic test, I can't be going around trying to remember which gene it is that is relevant to that. The system needs to tell me."* (Clinical Pharmacy Lead)

Unlike standard patient records, the UK is building a what a Clinical Pharmacy Lead described as a *"cloud-based unified genomic record"* because the vast amount of genetic data cannot fit into a standardised patient file. When digital systems are fragmented, clinicians may not have access to the necessary genomic information when making prescribing decisions. Without optimal data, these tools cannot function effectively.

## *Risk of Unequal Access to the Benefits of Pharmacogenomics*

The true value of pharmacogenomics lies in its application across the entire population, rather than isolated cases or individual patients. However, attendees of the roundtable expressed concerns about the potential for pharmacogenomics to worsen health disparities. They highlight the risk that, if pharmacogenomics is implemented in an uncoordinated manner, it will primarily benefit certain groups, such as those in well-resourced areas or with better access to healthcare. This could leave underserved populations behind and further exacerbate health inequalities.

An attendee noted:

*"What we don't want to do is open up the floor to privilege those that have had the*

*testing done against those that haven't. It's about uniformity and making sure that we're all kind of moving towards that so that it's the norm of every patient coming in."* (Lead Pharmacist in Workforce Development)

This point is further emphasised by another attendee:

*"We need to be careful that access remains equitable, thinking about the inclusion health groups, [...] making sure that we get equitable access right."* (Head of Medicines Optimisation)

## 4. Workforce Transformation and Education

The transformation of the pharmacy profession, particularly with the 2026 milestone for all newly qualified pharmacists to become IPs, requires a fundamental shift in education, funding, and workforce strategy. Speakers at the roundtable emphasised that while the ambition is clear, the infrastructure to support this transition remains fragile.

### *The IP Transition and Funding Disparities*

A central concern raised during the discussion was the lack of parity in funding for supervision compared to other healthcare professions. The integration of IP is contingent not just on university courses, but on the availability of Designated Prescribing Practitioners (DPPs) to supervise trainees.

Our speakers highlighted a critical gap in support mechanisms:

*"One of the fundamental issues is around DPP funding (...) every other academic course for advanced clinical practice, nursing, prescribing skills, training, all come with funded supervision except for pharmacy."* (Associate Director for Pharmacy, Workforce, Medicines Quality & Safety)

Without addressing this, there is a risk that the policy will fail in practice. Indeed, a participant noted that without contractual and financial support, *"no one will be prescribing anything"* (Head of Pharmacy). They elaborated that while new graduates may technically be qualified, they are distinct from experienced practitioners: *"They are*

*not the same as pharmacists who've been practicing for 10 years (...) They are a different group of people, and they're going to need different support."* (Head of Pharmacy)

## *Academic Agility and Digital Access*

The roundtable exposed a disconnect between national policy ambitions, such as the digital shift outlined above, and the operational reality for educational institutions. Universities are often expected to teach digital literacy and integrated care systems without access to the necessary tools.

One of the barriers explored throughout the discussion was a financial one, which hinders realistic training: *"Education providers often don't have access to these digital tools that we're all talking about (...) So, for example, for us to teach on SystmOne, we have to buy that software. We have to buy into it. We don't get it for free."* (Head of School of Pharmacy)

Furthermore, the short-term nature of funding cycles hampers long-term strategic planning. An example shared in the discussion is that NHS England *"only provides funding for any programmes really for a year at a time, so you can't long-term plan"* (Head of School of Pharmacy). This uncertainty affects the ability of providers to employ staff on long-term contracts or build sustainable, innovative programmes.

## *Professional Development and Credentialing Challenges*

Upskilling the legacy workforce, that is, experienced pharmacists who are not yet prescribers, presents a parallel challenge. The discussion revealed that the current frameworks for Continuing Professional Development (CPD) and credentialing are often viewed as barriers rather than enablers.

An attendee described the Royal Pharmaceutical Society credentialing process as *"not for the faint-hearted",* sharing their own experience: *"I myself have tried to credential a couple of times and not met the standard, despite 25 years of practice and being a clinical leader in a lot of fields, because my experience is not completely hospital-based. There seems a lack of understanding around consultancy in a different*

*setting."* (Clinical Pharmacist)

There was an overall call for a more adaptive model that supports diverse career paths rather than a one-size-fits-all approach. As our Chair, Reena Patel, summarised, the modern workforce is increasingly seeking *"diverse careers, portfolio careers, hybrid career models where they're not stuck in just one area of pharmacy."* (Senior Healthcare Strategy Consultant, RP Healthcare Consultancy Ltd)

### *Defining the Future Pharmacist*

There was a consensus that curricula must evolve beyond traditional boundaries to reflect the reality of modern practice, including genomics, AI, and integrated care. There is a need to move away from a *"bog-standard curriculum that does not reflect what the reality actually is"* (Clinical Pharmacist), advocating for bold leadership to ensure students are equipped for the complexities of the healthcare landscape they will enter.

However, innovation is often obstructed by rigid funding structures. As noted by one of the attendees: *"funding harmonisation for secondary care in particular has hampered us because we're no longer innovating"* (Lead Pharmacist in Workforce Development). They shared an example where they had to pull a university placement due to these constraints, illustrating how financial standardisation can inadvertently reduce the quality and breadth of workforce training.

## Key Insights

### 1. *Pharmacy must transition from transactional contracting to strategic commissioning*

Pharmacy cannot continue operating in a model dominated by transactional contracting and activity-based work. The profession needs to align with system ambitions for strategic commissioning, focusing on population outcomes, personalised care, and neighbourhood models rather than cost-driven delivery. This requires reframing pharmacy's identity beyond money management and asserting its role in driving health

impact across neighbourhoods.

2. *Expanding pharmacy's role in neighbourhood care and wider determinants of health*

As care moves closer to home, pharmacy is well-positioned to support behavioural change, lifestyle interventions, and prevention across neighbourhoods. Pharmacists can engage patients in real community settings, helping shift the system from reactive treatment to proactive wellbeing. This underpins pharmacy's mission as a neighbourhood health asset rather than solely a medicines specialist.

3. *Innovation requires stopping outdated or low-value activities to release capacity*

Pharmacy teams are being asked to adopt new responsibilities, such as genomics, digital tools, and prescribing, without dropping older processes, thus creating unsustainable pressure. Decisions must be made on what pharmacy should stop doing to create the capacity required for transformation. Innovation cannot be layered on top of the old system, rather it requires the conscious removal of obsolete processes.

4. *Pharmacogenomics is a growth opportunity, but requires system-wide adjustments*

Pharmacogenomics presents a significant future area where pharmacy could lead, but success depends on addressing critical questions regarding who monitors the evidence base, how value is demonstrated, and how equitable access is ensured. There is a risk of widening inequalities if implementation happens unevenly or without clear national frameworks to integrate genomics into existing medicines optimisation pathways.

5. *Digital fragmentation remains a critical barrier to integration*

Variation in EPMA systems and the lack of a unified patient record stand as core obstacles to medicines optimisation and safe, personalised care. As genomics advances with a single cloud-based record, pharmacy requires similar digital interoperability and strong digital literacy to effectively handle emerging tools, such as AI formularies.

### 6. *Independent prescribing expansion and workforce development must be tackled in tandem*

The requirement for all pharmacists to register as IPs from 2026 will reshape roles, supervision, and expectations for both new and senior staff. However, current CPD, credentialing, and training structures are failing to keep pace due to limited protected learning time, a lack of funded supervision, and slow curriculum adaptation. Significant investment in workforce readiness, support structures, and education reform is essential to ensure the prescribing transition succeeds.

## Key Recommendations

The following recommendations have been organised by themes and are directed at key stakeholder groups.

### *Moving from Transactional Contracting to Strategic Commissioning*

**UK policymakers** must champion relational contracting frameworks that reward long-term partnerships. As observed in the Dutch Health Systems which involved multisectoral approach, to reach a landmark cross-sectoral agreement termed the Integrated Care Agreement (Integraal Zorg Akkoord, IZA) aimed at explicitly moving from transactional, volume-based contracting toward strategic, population-focused, integrated commissioning (Kroneman et al. 2023; WHO 2024). This strategy may be applied to the UK by updating national pharmacy contracts to include incentives for systems-level collaboration. Decision-makers would empower pharmacists to think beyond their usual confines. This approach encourages healthcare professionals to work together to care for the community, instead of acting independently. This shift could lead to innovative prevention programs, combining medicines management with lifestyle support, ultimately easing the burden on hospitals for chronic care.

**NHS England** should pilot integrated care models in select regions, blending pharmacy teams with neighbourhood services to tackle the various observed persistent challenges. Prioritising metrics for high-cost, low-volume cases would encourage

data-sharing across silos, optimising costs while delivering person-centred care for long-term conditions.

**ICBs** must lead by mapping local service gaps and convening multi-stakeholder "neighbourhood health hubs" that expand prevention beyond pills to include community activities and voluntary sector input. Frontline leaders in ICBs might start small, like monthly roundtables where pharmacists, general practitioners, and local authorities co-design chronic condition pathways. This patient-centred approach would reduce polypharmacy risks and promote sustainable behaviours through genuine relationships.

**Pharmacy leaders and professional bodies** such as the Royal Pharmaceutical Society transition to become the Royal College in 2026, should establish intentional leadership and invest in training that cultivates systems thinking, equipping teams to move from "large teams of providers" to diverse collaborators driving holistic service delivery. Training of the future workforce must be intentional. By advocating for curriculum reforms and launching mentorship programs pairing hospital pharmacists with community peers, they build future teams rendering diverse services while working together as a functional unit.

**Educational Institutions**, including universities and training bodies should embed relational competencies into pharmacy curricula, using case studies to teach students how transactional pitfalls lead to fragmented care. Envision future pharmacists learning through simulations where they partner with "virtual" neighbourhoods to optimise service delivery. Equipping the future workforce for the dynamic future should also be intentional. In addition, collaborating with industry on placements would prepare graduates for innovative, team-based roles that prioritise long-term patient care and relationships.

**Pharmaceutical industry partners** can support by funding tech tools for shared medication reviews, like apps that flag polypharmacy risks across care settings and promote non-drug alternatives. Rather than pushing volume-based sales, they might sponsor pilot collaborations between pharmacies and local authorities, sharing data to

optimise costs in high-volume chronic care. This partnership mindset would position industry as enablers of holistic health, fostering trust through initiatives that save money system-wide while improving lives.

### *Digital Integration, Interoperability and AI Governance*

**UK healthcare policymakers** must establish a national policy direction to inform the implementation of a single EPMA system, drawing inspiration from the Scottish model. They should allocate funding and capital investment to facilitate this national transition to a single EPMA, promoting standardisation across NHS Trusts. Additionally, UK healthcare policymakers should develop a realistic timeline for these transformations, incorporating monitoring and evaluation through national digital health governance structures to ensure effective implementation.

**ICBs** should establish system-wide formularies for AI. The concept of an "AI formulary" is similar to a medicine's formulary, used to manage which AI tools are approved, how they are used, and who is responsible for their oversight. These formularies will coordinate AI use across ICBs, ensuring consistency in primary and secondary care.

**NHS England and the DHSC** will play a crucial role in establishing national frameworks for the implementation of AI, AI governance, and an AI formulary within the UK healthcare system. They should collaborate with industry partners, professional bodies, and patient groups to set national standards and approve criteria.

To enhance the collaboration and interoperability initiatives, **NHS England and the DHSC** should prioritise the establishment of standardised protocols for information sharing across NHS Boards. This could include the development of comprehensive training programs focused on the implementation of shared standards, such as medicines dictionaries and clinical safety standards. Moreover, increasing the frequency and depth of knowledge-sharing sessions can facilitate the dissemination of lessons learned from early adopter Boards to a wider audience. Lastly, ensuring that the EPMA system seamlessly connects with other national systems, including lab systems and identification databases like the CHI number, will further strengthen integrated

healthcare delivery and improve patient safety outcomes.

Additionally, **NHS England** must invest in developing the digital skills of pharmacy professionals through structured training in data analytics, digital tools, AI-informed decision-making, and the use of shared care records. This investment will enable the workforce to harness technology to optimise medication use, target interventions, and achieve measurable improvements in patient outcomes.

**Pharmacy leadership and professional organisations**, such as the Royal Pharmaceutical Society, establish standards of practice for their professions and provide clinical leadership. Regarding the implementation of AI in the UK healthcare system, these bodies should contribute to the development of profession-specific AI guidance. They need to define the competencies required to use specific AI tools, create ethical frameworks, and establish training curricula to ensure successful implementation and positive impact.

To meet evolving NHS demands, pharmacy workforce development must be driven by cross-sector collaboration. Industry partners, including pharmaceutical companies, technology providers, and community pharmacy employers, should be actively involved alongside the NHS in shaping curricula, offering practical training, and co-developing innovations.

### *Genomics and Pharmacogenomics in Practice*

**UK healthcare policymakers and NHS England** must establish clear national frameworks for pharmacogenomics implementation to prevent uncoordinated unveiling that would risk widening health inequalities. This requires investment in research to demonstrate real-world value and affordability, working with the National Institute for Health and Care Excellence to develop pragmatic cost-effectiveness models that account for long-term prevention benefits rather than immediate drug cost. Protected funding should be allocated to enable phased implementation across regions, ensuring equitable access and workforce capacity to support integration.

**ICBs** should develop population-level strategies for pharmacogenomics integration aligned to local health needs and deprivation profiles. Rather than establishing pharmacogenomics as a separate pathway, it should be embedded within existing medicines optimisation structures and governance frameworks. ICBs should commission primary care pharmacists to lead population health approaches to deprescribing and treatment optimisation at scale.

**Pharmacy leadership and professional bodies** should establish clear competency frameworks for pharmacogenomics practice across specialist and generalist roles. Studies on pharmacogenomics highlight the need for clear definitions of responsibilities among healthcare professionals (Apellaniz-Ruiz et al., 2024). Development of profession-specific guidance on integrating genomics into existing workflows will support practitioners in applying genomic knowledge as one more thing within the standard workflow rather than an isolated innovation.

**Universities and educational institutions** must weave genomic awareness into existing curricula and speciality training rather than teaching genomics as a standalone subject. Curricula should emphasise the mechanistic understanding of pharmacogenomics and its application across multiple settings. Collaboration with NHS early-adopter sites will enable students to encounter real-world implementation models and understand the evidence base for pharmacogenomics integration.

**For industry partners and technology providers** must support the development of cloud-based unified genomic records and clinical decision support systems that enable real-time access to relevant genetic information at the point of prescribing. In various regions of Spain, including the Basque Country and La Rioja, genetic information was securely accessible by specialists and physicians to ensure a smooth patient journey (Apellaniz-Ruiz et al., 2024). Educational partnerships with universities and NHS organisations will prepare the workforce to interpret and act on genomic data safely and equitably. Investment in solutions that integrate genomic information with existing EPMA systems is critical to overcome current digital fragmentation barriers.

### *Workforce transformation and Education*

**UK healthcare policymakers and NHS England** must establish dedicated funding streams for DPPs to achieve parity with other clinical professions. This requires multi-year funding agreements for educational institutions, enabling strategic planning and curriculum innovation rather than annual cycles that prevent long-term investment. France's shift from product-oriented to patient-centred pharmacy education was underpinned by multi-year national strategies and stable funding, allowing progressive skill-based curricula and long-term academic staffing to be sustained (Ranchon et al., 2024). Protected learning time for pharmacy professionals within job plans should be mandated to support CPD and specialist training, aligned to the 2026 IP transition.

**ICBs** should commission flexible apprenticeship and mentoring models for experienced pharmacists pursuing prescribing qualification, recognising diverse career contexts and practice settings. For instance, the University of British Columbia's Pharmacists Clinic shows how integrated training sites can simultaneously support service delivery and skill development: as a university-affiliated, pharmacist-led primary care clinic, it functions as a "living laboratory" where pharmacists provide comprehensive medication management while students learn in a real clinical environment under supervised practice, aligning workforce training with local primary care needs (Gobis et al., 2016). These pathways must evolve beyond the one-size-fits-all approaches to value consultancy roles and portfolio careers. Local workforce plans developed in collaboration with universities and community pharmacy employers will identify emerging specialist roles and build targeted training pipelines to address system needs.

**Educational providers** must secure free or subsidised access to digital tools and systems used in NHS practice through partnerships with NHS and industry. In its 2021 global survey, the International Pharmaceutical Federation found that a large proportion of pharmacy schools do not incorporate digital health education, highlighting a critical gap in pharmacy education worldwide (Mantel-Teeuwisse et al., 2021). Curricula should evolve to integrate genomics, AI literacy, digital systems, and population health from the outset, thus moving away from traditional discipline-based

teaching that does not reflect practical reality. Structured leadership and digital skills pathways embedded within clinical roles will support both new graduates and the legacy workforce in integrating new competencies.

**Pharmacy leadership and professional bodies** must modernise credentialing and CPD frameworks to recognise diverse career pathways and specialist practice settings, therefore removing barriers that discourage upskilling among experienced practitioners. Co-development of profession-specific guidance on genomics, AI, and digital decision support should occur in collaboration with NHS England and industry partners. Professional leadership should drive the national conversation on workforce strategy, succession planning, and the structural changes required to deliver the NHS 10-year plan ambitions.

Pharmacy workforce development must be driven by cross-sector collaboration, with **pharmaceutical companies and technology providers** actively involved in shaping curricula and offering practical training. A US study found that pharmacy programmes using teaching electronic health records were able to deliver more realistic skills-based training, improve students' confidence with digital systems, and better prepare them for technology-rich practice environments (Ives et al., 2024). Educational licences for digital platforms and prescribing software should thus be provided to educational institutions and NHS early-adopter sites, ensuring students graduate with practical competency aligned to their work environment. Industry partners should establish communities of practice to facilitate shared learning and accelerate the translation of innovation into practice.

## Attendees of Roundtable Four

The insights and recommendations of this report have been informed by a roundtable event which took place on the 24th of September 2025, under Chatham House Rule. A diverse group of 19 delegates from across different sectors within pharmacy shared their expertise and insights to inform this policy report.

*Figure 1: Roundtable Four Delegates Organisational Background*

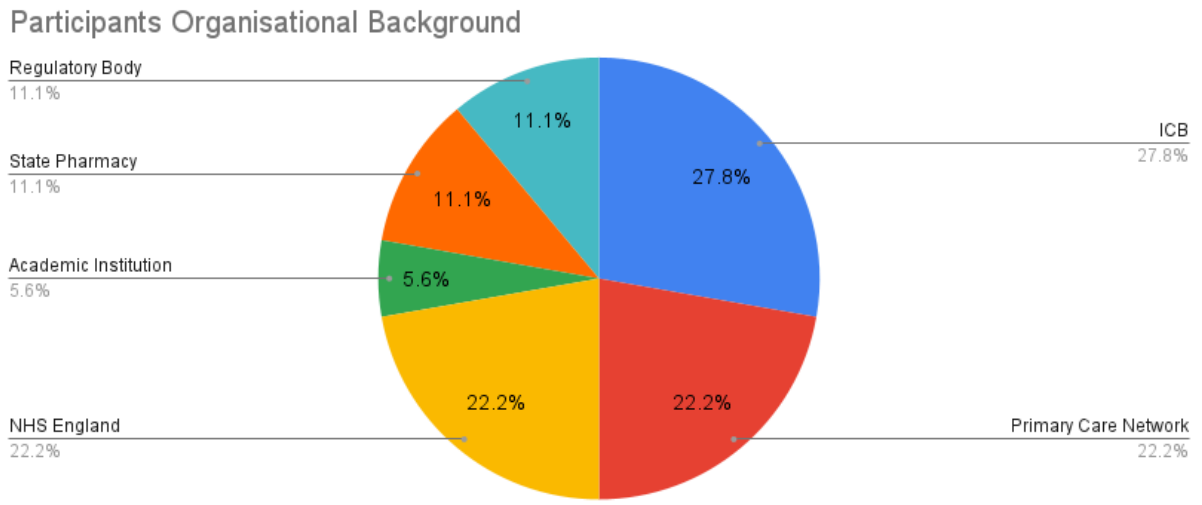
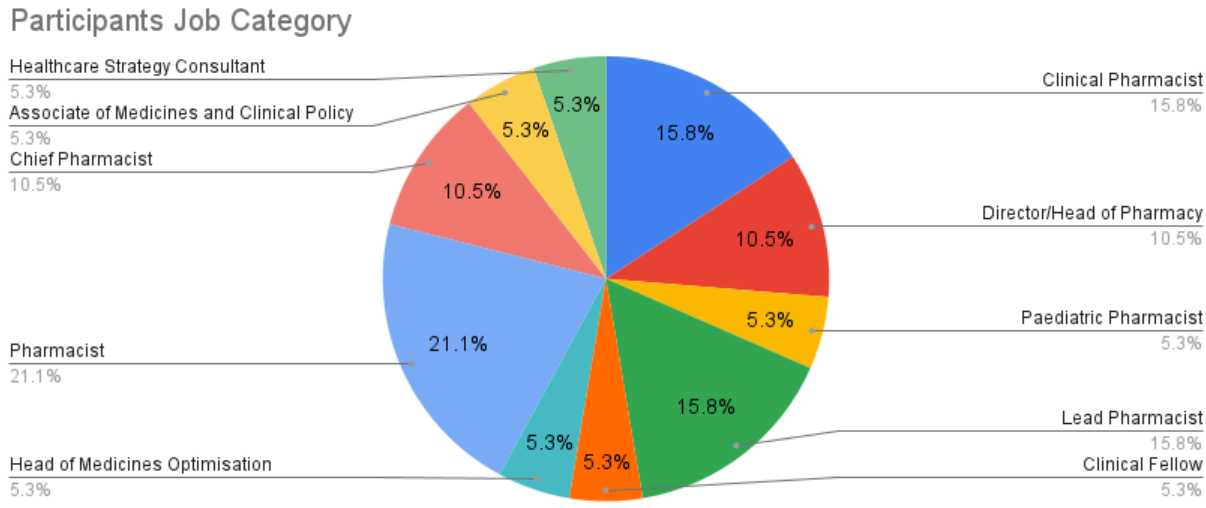



*Figure 2: Roundtable Four Delegates Job Category*



## Abbreviations

**AI** – Artificial Intelligence

**CPD** - Continuing Professional Development

**DHSC** - Department of Health and Social Care

**DPP** - Designated Prescribing Practitioners

**EPMA** - Electronic Prescribing and Medicines Administration

**ICB –** Integrated Care Boards

**IP** - Independent Prescribers

**NHS** – National Health Service

**UK** - United Kingdom

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