Medicines Optimisation Innovation Centre

Pharmacy response to Covid-19

Review 2: The role of pharmacy in the Covid-19 vaccination programme

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Acronym list

Acronym	Full term
AHP	Allied Health Professionals
BSO	Business Services Organisation
BSOPaLS	Business Services Organisation Procurement and Logistics Service (BSOPaLS)
CAP	Centralised Authorisation Procedure
COSHH	Control Of Substances Hazardous to Health
Covid-19	Coronavirus disease caused by the SARS-CoV-2 virus
CPNI	Community Pharmacy Northern Ireland
CPO	Chief Pharmaceutical Officer
CPVS	Community Pharmacy Vaccination Service
DH	Department of Health
ECHO	Extension of community healthcare outcomes
FYT	Foundation Year Trainee
GB	Great Britain
GDP	Good Distribution Practice
GP	General Practitioner
GPP	General Practice Pharmacist
HSC	Health and Social Care
HSCB	Health and Social Care Board (now SPPG)
ICT	Information and Communication Technology
IT	Information Technology
JCVI	Joint Committee on Vaccination and Immunisation
MHRA	Medicines and Healthcare Products Regulatory Agency
MOIC	Medicines Optimisation Innovation Centre
MVC	Mass Vaccination Centre
NI	Northern Ireland
PASD	Pharmaceutical Advice & Services Directorate
PGD	Patient Group Directive
PHA	Public Health Agency

PHE	Public Health England
PIL	Patient Information Leaflet
PMMT	Pharmacy and Medicines Management Information Team
PPE	Personal Protective Equipment
PSNI	Pharmaceutical Society of Northern Ireland
REPP	Regional Emergency Preparedness Pharmacist
RNIB	Royal National Institute of Blind People
RP	Responsible Person
RPhPS	Regional Pharmaceutical Procurement Service
RPQAS	Regional Pharmaceutical Quality Assurance Service
RQIA	Regulation and Quality Improvement Authority
SAI	Serious Adverse Incident
SEHSCT	South Eastern Health and Social Care Trust
SmPC	Summary of Product Characteristics
SOP	Standard Operating Procedure
SPPG	Strategic Planning and Performance Group
UKHSA	UK Health Security Agency
VMS	Vaccines Management System
VP	Victoria Pharmaceuticals
VTF	Vaccine taskforce
WHSCT	Western Health and Social Care Trust

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1. Introduction

1.1 Background

In September 2020, a rapid review of changes in Health and Social Care (HSC) pharmacy services during the first wave of the Covid-19 pandemic in Northern Ireland (NI) was published[1]. The review collated input from all sectors and described the wide range of interventions made by pharmacy teams that were necessary to ensure that both patients and the public had access to medicines and pharmaceutical care throughout the initial stages of the Covid-19 emergency.

Since then, pharmacy in NI has continued to play an integral role in the Covid-19 pandemic response in subsequent waves, including the rollout of Covid-19 vaccination and novel therapeutic agents. It is important that now the acute response is over and pharmacy services return to business as usual, that a record is made of the role that pharmacy played in the rollout of the Covid-19 vaccination programme to identify the challenges encountered and lessons learned.

1.2 Aims

The Department of Health (DH) commissioned the Medicines Optimisation Innovation Centre (MOIC) to undertake a review aiming to identify good working practices, challenges encountered and lessons learned in relation to the role of pharmacy teams in all sectors in the Northern Ireland Covid-19 vaccination programme.

2. Methodology

Representatives from the DH Pharmaceutical Advice and Services Directorate (PASD), Strategic Planning and Performance Group (SPPG), HSC Trust Heads of Pharmacy and Medicines Management, Regional Pharmaceutical Procurement

[1] Scott M, Fleming G, Martin S. Rapid review of pharmacy services changed in response to Covid-19 in Northern Ireland. September 2020. Available Rapid review of pharmacy services changed in response to Covid-19 in Northern Ireland | Department of Health (health-ni.gov.uk).

Service (RPhPS), Victoria Pharmaceuticals (VP), Vaccine Contract Distributor, Community Pharmacy NI (CPNI) and GP Federation General Practice Pharmacists (GPPs), were invited to complete a workbook designed by MOIC. The purpose of the workbook was to provide a detailed account of the role and contribution of pharmacy teams to the delivery of the Covid-19 vaccination programme.

Representatives were given approximately 6 weeks in October and November 2023 to consult with colleagues, consider and provide their response. Their account of the contribution of their organisation and teams was to cover the planning period (Autumn 2020) from preparations for the first Covid-19 vaccinations and the subsequent rollout until the end of June 2022.

Following receipt of the completed workbooks, MOIC sought further clarification from organisations and/or individuals on specific aspects as required and a draft version of collated responses was sent to contributors for comment.

3. Results

Written responses were received from all invited representatives. A review of all written responses was completed by MOIC and further clarification was sought where required. The responses were collated and condensed into a draft report. All contributors were given the opportunity to review and comment on the draft before this report was finalised.

Notes:

The Department of Health Strategic Planning and Performance Group (SPPG) was formerly the Health and Social Care Board (HSCB) until 31 March 2022.

The UK Health Security Agency (UKHSA) has taken over the public health functions from Public Health England (PHE) as of October 2021.

4. Covid-19 vaccination service development and strategic management

4.1 Background

The main objective for the Covid-19 vaccination programme is to protect those at highest risk from serious illness or death from Covid-19. The programme officially commenced in Northern Ireland on 8th December 2020. Pharmacy teams in community, hospital and general practice roles as well as pharmacists with regional responsibilities including policy, commissioning and procurement roles have been involved in a wide range of aspects relating to Covid-19 vaccine deployment, including strategic planning, procurement, oversight of storage and distribution, development of medicines governance processes for safe reconstitution and administration, timely and efficient supply including packing down to manageable supply quantities, waste management and record keeping.

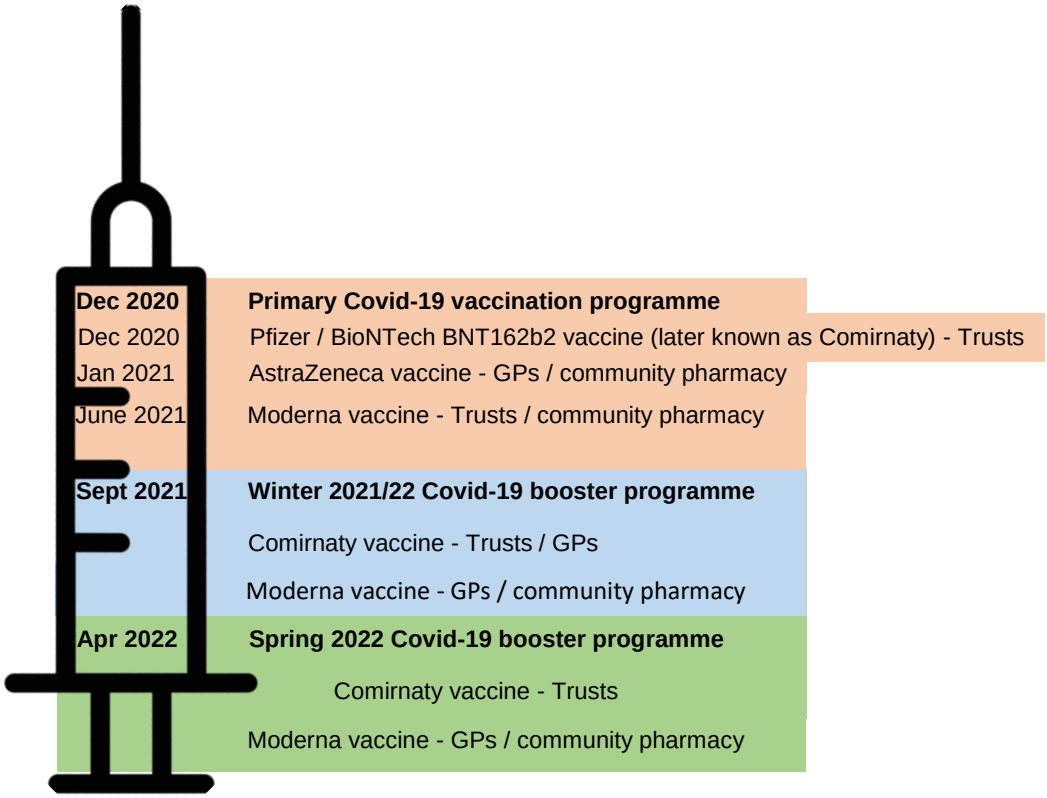

Figure 1. Infographic showing which Covid-19 vaccinations were used in different settings.

4.2 Challenges posed by vaccine characteristics

The vaccines deployed in the Covid-19 vaccination programme included novel mRNA vaccines such as the Pfizer / BioNTech BNT162b2 vaccine (later known as Comirnaty) which due to their physical and pharmaceutical characteristics, such as distribution at ultra-low temperature storage of up to -90°C, required pharmacy teams to be closely engaged with operational delivery to ensure that the vaccines were used safely and effectively. Alongside these complexities, timely mobilisation of pharmacy teams in all sectors was instrumental in managing the logistics involved with the safe distribution of vaccines. This was necessary for delivery of a population-level vaccination service that was required to vaccinate as many vulnerable individuals as soon as possible, whilst maximising the impact of the limited supplies of vaccine available in the early stages of the programme.

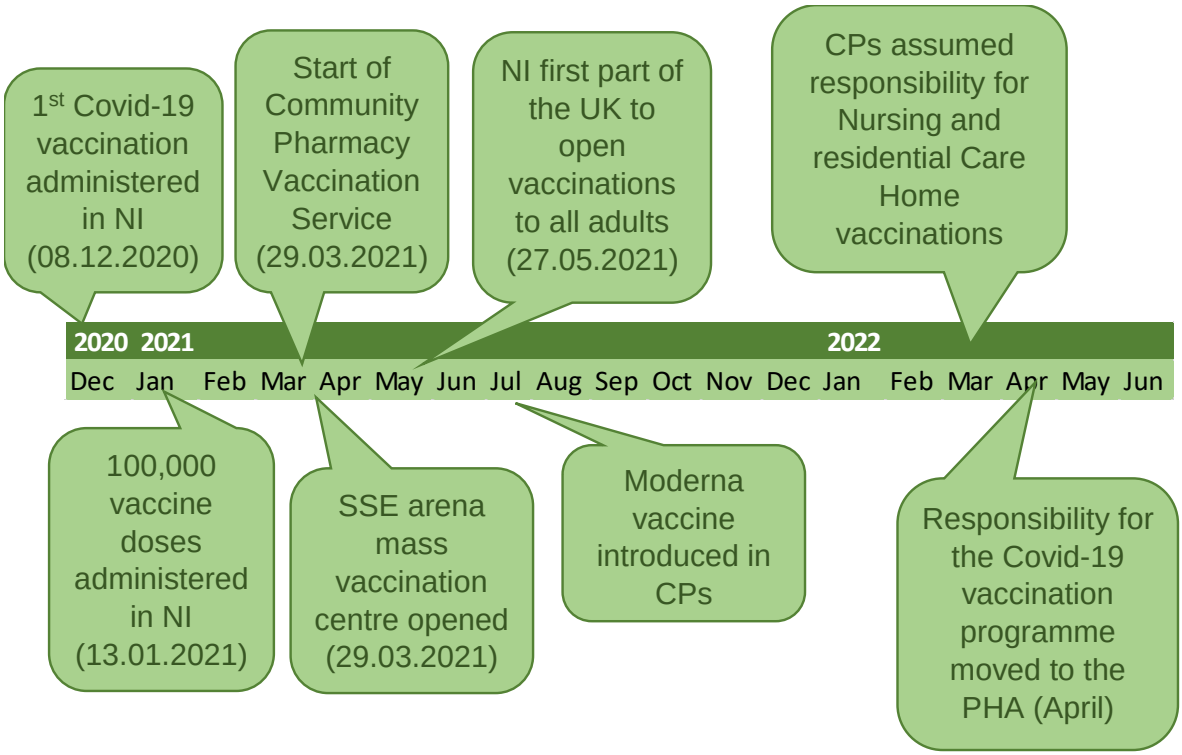

Figure 2. Timeline of key milestones

4.3 Development of regional pharmacy model

DH led the strategic management and deployment of Covid-19 vaccines as they became available. The Chief Medical Officer chaired the Vaccination Oversight Board on which pharmacy was represented by the Chief Pharmaceutical Officer (CPO). A vaccination programme lead was appointed and was accountable to the Vaccination Oversight Board and chaired the Vaccination Implementation Group. Pharmacy and distribution aspects were considered by the Pharmacy Storage & Distribution working group which in turn reported to the Vaccination Implementation Group.

The Pharmacy Storage & Distribution working group was led by a Senior Principal Pharmaceutical Officer within the CPO's team. The group met weekly in accordance with an agreed terms of reference and project plan and led on the delivery of a pharmacy delivery model for the vaccination rollout that ensured pharmacy support was available in all sectors to support the safe and timely distribution and deployment

of vaccines while meeting all legal and regulatory requirements set out in the Human Medicines Regulations 2012. To achieve this and support vaccination policy and deployment, the working group engaged with:

- Delivery partners in HSC Trusts
- Community pharmacy
- General practice
- Vaccine contract distributor
- Medicines and Healthcare products Regulatory Agency (MHRA)
- UK Vaccine Task Force (VTF)

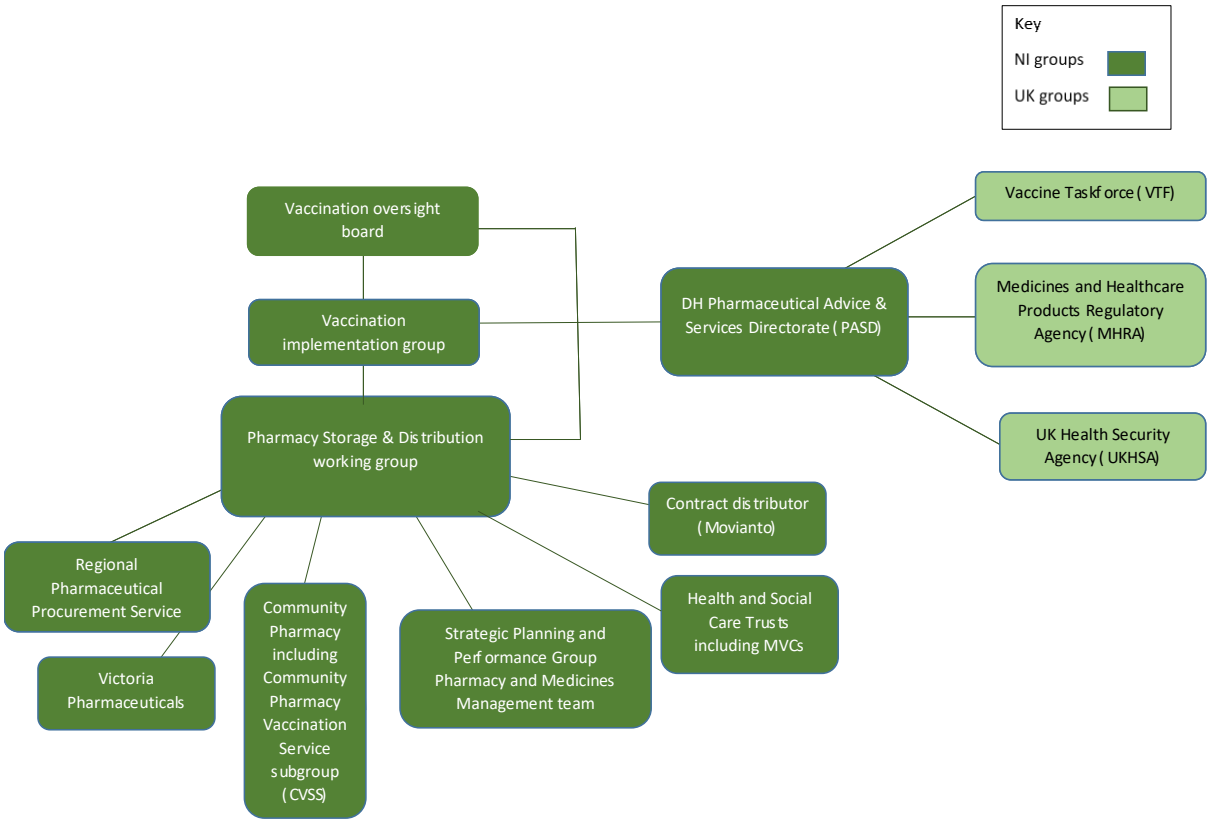

Figure 3. Diagram showing communication and collaboration pathways for the Covid-19 vaccination programme in NI.

This model had to address a range of challenges posed by the physical and pharmaceutical characteristics of novel vaccine products, including large pack sizes, presentation as multi-dose vials, requirements for ultra-low temperature storage, restrictions on time available for transport and short expiry dates of the product upon defrosting and reconstitution for administration.

These challenges meant that the preferred deployment model for the Pfizer / BioNTech BNT162b2 vaccine was via HSC Trusts, to utilise the skills and expertise of HSC Trust pharmacy teams working under the overall medicines governance and professional leadership of HSC Trust Heads of Pharmacy and Medicines Management.

4.4 UK wide engagement

The CPO and her team engaged extensively with national bodies involved in the vaccination rollout including UK Health Security Agency (UKHSA) and the VTF to represent NI interests in UK-wide discussions on vaccine deployment. They liaised with the MHRA to address emerging issues relating to licensing of vaccines arising from the UK's exit from the European Union in December 2020 and to ensure that the preferred vaccine deployment model met all legal and regulatory requirements. This engagement enabled DH to provide clear guidance to HSC Trusts regarding the premises, governance, workforce and regulatory requirements for vaccine deployment within Trust vaccination centres.

4.5 Challenges arising from EU exit and the Northern Ireland Protocol

The introduction of the Northern Ireland Protocol from January 2021 meant that NI remained within the scope of the European Commission's Centralised Authorisation Procedure (CAP) for new and innovative medicines, including vaccines. This meant that approval timelines for vaccines in NI were not always consistent with timelines for approval in Great Britain (GB), where vaccines were authorised by the MHRA. This necessitated regular engagement with the MHRA to identify areas of potential and actual regulatory divergence and, where identified, to implement mitigations necessary to maintain equity of access for NI. These mitigations included the use of temporary authorisation provisions under Regulation 174 of the Human Medicines Regulations 2012 which allowed vaccines to be deployed in NI at the same time as in GB.

4.6 Storage and distribution arrangements

Initial UK-wide preparations for vaccine storage and distribution were undertaken by the UK VTF, in conjunction with a commercial pharmaceutical distributor and UKHSA. Storage and distribution of all Covid-19 vaccines in Northern Ireland was undertaken by a contracted commercial pharmaceutical distributor. Vaccines were delivered under Good Distribution Practice (GDP) compliant conditions, and were distributed to Trusts, mass vaccination centres, General Practitioner (GP) surgeries and community pharmacies across Northern Ireland in accordance with the requirements in the relevant Summary of Product Characteristics (SmPC) or equivalent Regulation 174 authorisation. Distribution of the Pfizer / BioNTech BNT162b2 vaccine to HSC Trusts was initially in the frozen (ultra-low temperature storage) state, widespread distribution of defrosted vaccine to Trusts only commenced in September 2022. Some large scale GP surgeries received defrosted vaccine (in 1170 dose trays) and smaller GP practices had access to thawed, 'packed down' (360 dose trays) vaccine during the winter 2021 booster campaign. This highlights a complex, mixed-model of delivery for the contract distributor to manage during this time period. The distribution model employed utilised both the existing UKHSA and DH/Public Health Agency (PHA) storage and distribution contracts which were in place prior to the onset of the Covid-19 pandemic to supply vaccine to providers.

Vaccine procurement and deployment to all Trusts, community pharmacies and GPs was overseen by the DH Responsible Person (RP) in line with the European Commission guidelines on GDP of medicinal products for human use (2013/C 343/01). The RP is a senior pharmacist appointed by DH with legislative responsibility for ensuring that all medicinal products are distributed in a safe and compliant manner. The RP discharged this role for the Covid-19 vaccination service through the Regional Pharmaceutical Procurement Service (RPhPS) and was ultimately responsible for ensuring that the processes were fit for purpose and compliant with GDP requirements. RPhPS and the RP retained oversight of storage and distribution activities involving stock distributed under the DH/PHA storage and distribution contract.

5. Operational deployment

5.1 Health and Social Care Trusts

Initially the Covid-19 vaccination service was offered by HSC Trusts to eligible cohorts using a number of different models to best reach as wide a range of individuals across the community. Vaccination of large sections of the population was completed by establishing mass vaccination centres (MVCs) in each Trust area of NI. Those who were eligible and able to attend MVCs were encouraged to do so but Trusts also provided vaccination in a range of settings outside of the MVCs which included: nursing and residential care homes; supported living accommodations and hostels; day centres; community hospitals; in-patients; workplaces; HM prisons; special schools; housebound patients; maternity clinics; and, mobile 'pop-up' clinics.

Vaccinating such a large percentage of the population at this speed and scale had never been completed before and as such, the mechanisms to facilitate this had to be identified and established at pace. Prior to the first vaccine being administered in NI in December 2020, pharmacy teams were closely involved in planning and operationalising MVCs in each Trust with the professional and legal responsibility for the safe and secure handling of the vaccine resting with the Trust Head of Pharmacy and Medicines Management. Trust pharmacy teams engaged directly with crime prevention officers and police to identify suitable rooms to store vaccine, procured fridges and freezers, liaised with the Pharmaceutical Society of Northern Ireland (PSNI) regarding premises registration, worked closely with council staff and all of the multidisciplinary Trust team including; Information and Communication Technology (ICT), estates, transport, communications and professional leads. Standard Operating Procedures (SOPs) were written for the running of the MVCs with regards to vaccine storage, temperature monitoring, vaccine delivery, maintaining the cold chain, safe handling, reconstitution of the vaccine and documentation of doses administered. Pharmacy teams provided training to other members of the vaccine team and provided answers to the many queries around vaccination, drug allergies and contraindications. Trusts typically developed a dedicated team of staff within the pharmacy department who were responsible for developing the SOPs to ensure safe ordering, receipt,

storage, defrosting, pack down, order set up, issuing of the vaccine and, acceptance of returns back into pharmacy.

A regional MVC was set up at the SSE arena in Belfast in March 2021. This was a MVC on a larger scale and was operated by the South Eastern HSC Trust (SEHSCT) to provide Covid-19 vaccinations for the eligible NI adult population. To operationalise this MVC, cooperation with pharmacy staff from other Trusts, SPPG, RQIA and GP federations was required to ensure the availability of the required pharmacy workforce. Similar issues were experienced in operationalising this MVC as in other Trust operated sites, however, staffing was particularly challenging. To meet the workforce requirements of the regional MVC a range of approaches were used including involving staff from the Ministry of Defence, pharmacists on the temporary register of the PSNI, rotational use of pharmacy workforce from other Trusts and other pharmacy staff recruited via workforce appeals. DH developed a number of vaccination protocols to facilitate the delivery and administration of Covid-19 vaccines by an expanded workforce, enabled by provisions in Regulation 247A of the Human Medicines Regulations 2012. This enabled additional staff groups such as suitably trained non-registered healthcare workers to support the vaccination programme to operate more effectively in MVCs and other settings without the need for an individual patient prescription to be in place. SEHSCT also operationalised NI's largest 'pop-up' MVC at the Titanic Exhibition Centre from 21st December 2021 to 16th January 2022 to increase vaccination capacity, reducing queues at other vaccination centres amid a surge in demand as concern grew about the Omicron variant.

355,000 vaccines were given and 1,370 staff were working on roster in the SSE arena MVC between 29/03/2021 and 22/08/2021

Each Trust established an allergy pathway to provide those individuals who were clinically unable to receive the Pfizer / BioNTech vaccination with an option to receive the AstraZeneca vaccine. Initially, supply of the AstraZeneca vaccine was limited so pharmacy supported appropriate triage by assessing referrals and providing advice when required. Information about allergies, cautions and contraindications for the Pfizer / BioNTech Covid-19 vaccine was updated regularly in the Summary of Product Characteristics and equivalent Regulation 174 authorisation documentation as experience with the vaccine grew, so this was a dynamic area of expertise. Pharmacists spent considerable time with patients counselling, assessing allergy status and deciding on vaccine appropriateness. Pharmacists also provided advice to medical, nursing and allied health professionals (AHP) staff on vaccine queries.

5.2 Nursing and Residential Care Homes

Nursing and residential care homes presented a unique challenge as their residents represented some of the most vulnerable members of society. As such these individuals were a priority for timely vaccination, however, they were unable to attend fixed vaccination clinics such as MVCs. Initially HSC Trust vaccination teams led the vaccination of nursing and residential care home residents, with support from Trust pharmacy teams. To facilitate this delivery model in care homes, an appropriate quantity of vials was supplied from the hospital pharmacy to mobile teams deployed by the Trust. Trust pharmacies packed down smaller quantities for use by Trust mobile teams under existing provisions in Section 10 of the Medicines Act 1968. Trust mobile vaccination teams transported the vaccine in validated vaccine transporters at 2-8°C. On arrival at the care home the mobile teams prepared the vaccine for administration in line with the manufacturer's instructions, in accordance with either a prescription or regional Patient Group Direction (PGD).

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Development of an approach by Trust pharmacy teams enabled vaccination of care home residents earlier than anywhere else in the UK

As the pandemic progressed, arrangements for vaccinating care home residents evolved and in Spring 2022 community pharmacy providers assumed responsibility for delivery of the Covid-19 vaccination to nursing and residential care home residents. This presented some initial challenges in establishing how to facilitate the 'pairing' of relevant care homes with their partner community pharmacies to ensure that all care homes had a designated community pharmacy who would deliver the vaccination service. The SPPG team modelled the likely numbers of vaccines required for each pharmacy after the completion of pairings of care homes with their local community pharmacies based on the Regulation and Quality Improvement Authority (RQIA) reported "bed occupancy" for each of the care homes. To facilitate vaccination at their 'paired' care home(s), community pharmacies had to engage with care home management and undergo pre-clinic planning to ensure patient consent to vaccination was obtained and adherence to best interest decision making protocols. Community pharmacies had to establish new SOPs for the provision of vaccination services in this new environment and were required to update these on multiple occasions as regional and national changes occurred. Training sessions were provided by the SPPG Pharmacy and Medicines Management Team (PMMT) information team to the care home providers. Regular meetings of the SPPG vaccination team with PHA staff and Trust in-reach nurses also helped to ensure timely and efficient vaccination of the care home population.

11,300 residents in 468 Care Homes were vaccinated by community pharmacy during the Spring 2022 campaign

5.3 Community Pharmacy

Vaccine deployment to community pharmacy providers was co-ordinated by a core team within the SPPG PMMT information team. This team worked closely with stakeholders to deliver the Covid-19 Community Pharmacy Vaccination Service (CPVS). Prior to the onset of the Covid-19 pandemic, community pharmacy involvement in vaccination programmes was limited to small cohorts of influenza vaccine. Many community pharmacies had no experience of providing a vaccination service. The SPPG team worked closely with Community Pharmacy Northern Ireland (CPNI) and the PHA in order to draw up the service specification. The COVID-CPVS commenced on 29th March 2021 with 347 pharmacies offering both primary and secondary vaccinations. Since March 2021, community pharmacy have been involved in a range of regional vaccine initiatives including the provision of off-site and walk-in clinics, booster campaigns, the provision of care home vaccinations, and the current transition to the “business as usual” Covid-19 vaccination programme.

Over 32,000 Covid-19 vaccines were delivered by the Community Pharmacy Vaccination Service in the first four weeks alone

5.4 General Practice Pharmacists

Prior to the Covid-19 pandemic General Practice Pharmacists (GPPs) were involved in supporting the winter vaccination programme for influenza and pneumococcal vaccinations through provision of pharmaceutical advice as part of their role. During the Covid-19 pandemic GPPs worked as part of the multi-disciplinary practice teams to administer Covid-19 vaccinations via clinic sessions or individual patient appointments. GPs are accountable for the safe and effective use of vaccines in their patients, however pharmaceutical advice and support was provided by SPPG pharmacy advisors and GPPs. This helped to ensure that the vaccines were used in a safe and effective manner.

5.5 Low uptake areas and special provision

The large numbers of community pharmacies delivering the Covid-19 vaccination service covered a wide geographical area and provided easy access for many patients. This enabled the SPPG pharmacy team to liaise with the PHA low uptake sub-group and provide community pharmacy support for dedicated vaccination clinics to promote vaccination of ‘hard to reach’ groups including the food processing, hospitality and maritime industries. There were also instances where a GP practice could not deliver the Covid-19 vaccination and local community pharmacies were asked to vaccinate the GP eligible practice population in addition to any local Trust provision.

The SPPG pharmacy advisors leading on vaccination engaged with the Royal National Institute of Blind People (RNIB) to provide pharmaceutical advice to inform the development of resources on vaccination aimed at visually impaired people, which highlighted how community pharmacy could support vaccination.

As part of the vaccination programme, HSC Trusts vaccinated large populations where English was not their first language. Trust pharmacy teams supported this by sourcing

translations of the vaccine patient information leaflet (PIL) in other languages, where available, this ensured individuals were able to provide informed consent to vaccination and were made aware of all necessary information about potential side effects and cautions for use.

Over 50 community pharmacies participated in the "big jab weekend" aimed at promoting vaccination in the lower uptake groups. This resulted in the administration of over 11,000 vaccinations in one weekend

6. Vaccine challenges and logistics

6.1 Information about vaccine characteristics

A challenge in the early stages of planning for deployment of Covid-19 vaccines was the limited information about the potential vaccine products in development. Planning and decision making about vaccine deployment is entirely dependent on the vaccine characteristics such as storage requirements, stability data, pack size and number of doses per vial. These characteristics have a large impact on strategic planning and decisions about how the vaccines are stored, transported and administered.

Once vaccine candidates began to be approved and more information on their individual product characteristics became available, new logistical challenges were identified. Initially, for example, the Pfizer / BioNTech vaccine required storage at ultra-low temperatures of up to -90°C, limited transitions to and from storage, limited time available for transport due to lack of physical stability data, and requirement for use of dry ice for distribution and its safe disposal under the Control Of Substances Hazardous to Health (COSHH) regulations. Other challenges included the large pack

sizes of 1170 doses which limited the ability to utilise the vaccine outside MVCs and large GP surgeries, the requirements for dilution and reconstitution under aseptic conditions and a short expiry time of several hours once reconstituted. From November 2021 to February 2022 ‘packed down’ quantities of Pfizer / BioNTech vaccine were available in pack sizes of 360 doses. As the programme matured and more knowledge about the vaccines was obtained, the summary of product characteristics for individual vaccine products were continually updated. This required continual review and updating of processes and SOPs which was challenging for pharmacy teams to manage. These changes also meant that vaccine handling eventually became more straightforward, for example, the requirement for the use of dry ice was removed and transport time restrictions were extended, which facilitated deployment of the vaccine outside MVCs.

The application of new knowledge about vaccine products led to policy changes with regards to the choice of vaccine deployed in particular population cohorts as new models of deployment became more feasible. Additionally, as available supplies of vaccine improved, this led to rapidly changing eligibility criteria with additional cohorts becoming eligible for vaccination in line with DH announcements. This constantly changing landscape was challenging to keep all stakeholders and public appraised of and consequently generated large volumes of queries for pharmacy teams in all settings. Additionally, there was occasional frustration in general practice and community pharmacy when information regarding vaccination such as changes to eligibility criteria was released to the public before it had been received by healthcare professionals, making it more difficult to be able to plan vaccination provision.

In terms of public access to vaccination information, the NI Direct, Business Services Organisation (BSO) and SPPG (then Health and Social Care Board)) webpages were used to signpost to the locations where vaccinations were available. These Covid-19 vaccination webpages listed the names, addresses and contact details of the contracted community pharmacies, with SPPG pharmacy advisors working to ensure that these resources were kept up-to-date. The publication of this resource enabled

patients to see which local providers offered vaccination in their area and provided information to help them arrange for vaccination in a timely manner. Initially the NI Direct webpage did not work well for visually impaired persons and a new map was developed by SPPG pharmacy teams to resolve this issue, with work being aided by the RNIB.

In order to mitigate against the limited information about vaccines, rapid changes to the vaccination programme and high volume of queries the following strategies were employed.

6.1.1 Establishment of multi-stakeholder groups and regular meetings

Effective communication between the various organisations involved in planning and deployment of vaccines and clarity of purpose had an important role to play. The early establishment of programme governance structures including the regional Pharmacy Storage & Distribution workstream and local meetings of Trust vaccination groups which invited input from all those involved in the vaccination programmes and disseminated key information about a fast changing programme was a key strength. Frequent (daily/weekly), well documented meetings of these groups were important to keep pace with the fast moving vaccination programme and provide timely updates summarising changes and key points for pharmacy providers. Good working relationships both within the pharmacy networks and wider healthcare teams were highly valued. This applied both to those already in place via established working practices and new relationships created during the vaccination programme deployment. These networks, established on a relational foundation (not transactional), afforded the ability to build on already established mechanisms for the planning and delivery of a highly complex programme at pace.

6.1.2 Training and support

Pharmacy teams in HSC Trusts were responsible for medicines governance relating to all aspects of the vaccination programme, while SPPG pharmacy teams supported community pharmacy contractors and GPs to ensure robust governance systems were

in place to support the deployment of vaccines. Pharmacy staff required training and were also responsible for training other members of the vaccination teams.

The Trust vaccination programmes relied on pharmacists providing training to all pharmacy staff, vaccinators and transport staff on vaccine handling, storage and reconstitution. Additionally, pharmacy staff supported the development of a competency assessment of vaccinators, where implemented, which assisted in delivering a safe service. Late in 2021 there was a move towards pre-recorded training due to it being a less labour-intensive way to provide the relevant training.

From the outset of the CPVS service, the SPPG pharmacy team provided supporting documentation on the BSO and primary care intranet websites, with links where appropriate to relevant PHA information. In addition, the community pharmacy ECHO platform was used extensively by DH, SPPG, and community pharmacies to share information about changes to the programme in an effective manner with the CPNI network. Attendance at these events was high despite the prevailing work pressures.

An ECHO training session for each iteration of the vaccine programme was developed and scheduled for community pharmacies who were undertaking vaccinations. This included the key detail on policy; eligible cohorts; vaccine choice; arrangements for special interest groups e.g. care homes, immunosuppressed, pregnancy and carers; arrangements for ordering, storage and handling of the vaccines; addressing issues such as obtaining patient consent for the service and how/when best interest decisions were made. The use of ‘pro forma’ and checklists were highlighted where appropriate and also how pharmacies could secure help from care home leads or obtain PHA vaccination support.

An area of communication identified as challenging by some community pharmacies was the use of HSC secure email for updated information on the vaccine programme.

Whilst this was a highly secure method of communication it was not as easily accessed by some pharmacies and this created an additional barrier to obtaining essential information about changes to the programme.

The IT security arrangements for operating MVCs off Trust sites often meant that there was slow internet connectivity, this was frustrating for pharmacy teams as it limited access to the regional Vaccine Management System (VMS) and to further information about the vaccine which was needed in order to respond to queries from vaccine teams.

6.1.3 Knowledge transfer

Patient Group Directions (PGDs) were developed in NI for all users (Trusts, GPs and community pharmacies), by the SPPG PMMT. These were used to facilitate the delivery of vaccinations in the health and social care setting, in line with national recommendations. Vaccination protocols authorised by the Minister for Health under Regulation 247A of the Human Medicines Regulations 2012 were also developed as an additional legal mechanism for vaccination, these enabled trained non-registered healthcare staff to support the vaccination process. The UKHSA templates were used as a basis for development of the NI PGDs and vaccination protocols. It was an important quality measure to have the wider public health expertise provided by UKHSA when developing PGDs and vaccination protocols. However, this meant that the NI PGDs and protocols were reliant on availability of the equivalent UKHSA PGDs and protocols, with additional time required for NI clinical review, amendment and multi-disciplinary sign off as well as Ministerial approval for vaccination protocols. The delays in getting updated PGDs and protocols developed and issued in line with the Joint Committee on Vaccination and Immunisation (JCVI) updates, and the DH release of new cohorts for vaccination sometimes led to unused vaccinator capacity within MVCs and the turning away of patients who became eligible very shortly thereafter.

Initially separate PGDs and protocols for each vaccine were created, this involved multiple phases of development for each PGD and protocol, each requiring multidisciplinary sign off. Vaccination protocols also required an additional step for DH pharmacy to seek and obtain Ministerial authorisation for issue. As the programme developed, a single PGD was produced that covered all relevant vaccines. The PGDs produced included Pfizer, AstraZeneca, Moderna, Novavax and Sanofi vaccines for each iteration of the programme reflecting the vaccine chosen for each stage of the vaccination programme over the years 2021-22. The SPPG PMMT team also produced infant and child PGDs for each programme which ran in 2021 and 2022. Vaccination protocols were also developed which mirrored the clinical content of both the spring and summer PGDs for 2021 and 2022.

In order for healthcare professionals to become eligible to operate under a PGD within the Trust's vaccination programme, a medicines management course had to be completed. Initially the HSC Clinical Education Centre did not have enough capacity to meet the high demand in order to get vaccinators qualified and authorised to vaccinate under PGDs.

6.1.4 SOPs

SOPs were a key tool in disseminating and standardising information on vaccine storage, handling and administration processes. These needed to be updated frequently in line with the release of new PGDs and changes in the vaccine Summary of Product Characteristics. Efficiencies could have been introduced by implementing regional SOPs, screening and administration forms that could have been utilised by all vaccinators regardless of provider.

6.2 Vaccine storage

Storage and distribution for products in the UK Covid-19 vaccination programme was carried out by a contracted pharmaceutical distributor on behalf of UKHSA, DH and the PHA. The contract distributor received deliveries from the manufacturer of vaccines in both the frozen and refrigerated state, depending on the requirements set

out in the Summary of Product Characteristics or equivalent Regulation 174 authorisation, for onward distribution to vaccine providers both as original packs and in a processed state (i.e. defrosted or defrosted and packed down).

The security of vaccines received was of paramount importance. This necessitated manned guarding of the vaccine at the contract distributor site and liaison by Trust pharmacy leads with crime prevention officers for security of vaccine stores in MVCs. The SSE arena layout and existing security arrangements worked well to ensure secure deliveries and storage of the vaccine.

To maintain the integrity of the Covid-19 vaccines, strict storage and handling procedures were adhered to in accordance with the manufacturer's requirements. The physical characteristics of the Pfizer / BioNTech mRNA vaccine, including the short shelf life of the vaccine once thawed, necessitated the requirement to distribute the vaccine to Trusts under ultra-low temperature storage arrangements. The Moderna vaccine, mainly used by GPs and community pharmacies, also had to be thawed before delivery as a 'fridge line' which had a short shelf life once defrosted. Systems were developed for ordering, use, safe storage and disposal of dry ice by the contract distributor and Trust providers in the initial rollout. This involved SOP production and consideration of the COSHH implications for safe handling and disposal of dry ice. The short expiry dates of vaccine also meant that ordering and replenishment of stock within Trusts was tightly managed by pharmacy teams to ensure minimal waste. Minimising vaccine wastage at the SSE Arena MVC was particularly challenging due to the large number of vaccinators, and fluctuations in the number of expected appointments compared to actual attendances.

New equipment was procured and installed throughout the supply chain to store, defrost and distribute Covid-19 vaccines. Equipment included but was not limited to:

- a large stationary chiller shipping container (reefer) was installed for the defrost process (contract distributor)
- a canopy was erected to protect dry Ice storage freezers (contract distributor)
- a large walk in -20˚C freezer was sited (contract distributor)
- ultra low temperature (-80˚C) freezers (contract distributor)
- multiple freezers on warehouse floor (contract distributor)
- procurement of defrost fridge or dedication of a previously owned fridge for the defrost process (community pharmacies)
- Procurement of ultra-low temperature (e.g. -86˚C) and -20˚C freezers (Trust pharmacy departments and Mass Vaccination Centres (MVCs))

Due to the short shelf-life of the vaccine product once thawed and limitations on transport time, robust cold chain maintenance throughout the storage and distribution chain had to be guaranteed which involved minimisation of delivery lead times. Initially thawing of the vaccine was undertaken by Trust pharmacy departments following delivery at ultra-low temperatures of -90°C, and this additional time had to be factored in before vaccine could be sent to clinics. In September 2021 the contract distributor developed a process which facilitated the thawing and distribution of the Pfizer / BioNTech and Moderna vaccines at fridge temperatures, typically 2-8°C. This helped to significantly reduce the time required to make vaccines available for use by vaccine providers upon delivery.

6.3 Vaccine quotas

In the early stages of the vaccination programme there were constraints in vaccination supply and production due to a limited global supply of vaccine. As part of strategic planning for deployment, DH policy was to ensure that early limited vaccine supplies were directed to vaccination of the most vulnerable individuals, such as care home residents and those with underlying health conditions. The use of vaccine quotas was employed by DH pharmacy leads to reduce waste and to ensure equitable access to vaccines across providers. Quotas were informed by the quantity of vaccine available for distribution and the eligible population cohort. In the early stages, quotas were

small and were dynamically updated, up to several times per week. Quotas of vaccines for Trusts were provided by DH to RPhPS. RPhPS manually monitored and controlled draw down from these quotas and communicated approval of Trust orders to the contract distributor, who in turn ensured that these were applied on the vaccine ordering system.

There were low levels of vaccine wastage (<1%) which maximised the impact of the vaccine on the population.

Administration of vaccines by GPs commenced in January 2021 and community pharmacies in March 2021, initially using the AstraZeneca vaccine. Quotas for community pharmacies and GPs were provided by DH to SPPG, who in turn supplied them directly to the contract distributor for application to their web-based customer ordering system. The use of this web-based ordering system removed the need for manual verification of adherence to quotas for these orders as the quotas were applied directly to the ordering system.

Quotas applied to community pharmacy were initially on a block basis (this subsequently moved to a historical baseline allocation) and were monitored by the SPPG pharmacy vaccination team. Quota adjustments were permitted, where appropriate, due to the variation in vaccination demand. Quota adjustments were however a time consuming and labour intensive process for SPPG pharmacy teams and the contract distributor. As levels of available vaccine improved, the requirement to set quotas for service providers was stood down, and providers were encouraged to only order stock necessary to meet their requirements.

6.4 Vaccine distribution

The contract distributor delivered Covid-19 vaccine to all vaccination points during this time period i.e. Trusts, MVCs, community pharmacies and GPs, with vaccine being delivered both at ultra-low temperatures and at 2-8°C.

Logistically, it was much more complex for the contract distributor to make small deliveries of cold chain (and, in some cases, frozen) vaccines to 348 different pharmacies than it was to send a single bulk delivery to a mass vaccination centre. Over 300 GP surgeries also received weekly deliveries of vaccine to facilitate their vaccination programmes.

Transportation duration time limitations were product specific and depended on the relevant product Summary of Product Characteristics, which were updated throughout as more physical stability data became available. This aspect was relevant to processes for packing down supplies of vaccine to smaller quantities, delivery to customers and onward distribution by Trusts to MVCs and to pop up clinics e.g. shopping centres, vaccination of housebound individuals and the post-primary school vaccination programme.

6.5 Vaccine pack down

The initial Pfizer / BioNTech vaccine was manufactured and supplied to the UK as large pack sizes of 1170 doses which was too large for many vaccinating centres such as GPs or community pharmacies to use within the limited post-thaw shelf life without high levels of wastage. A process was developed which allowed for the assembly and distribution of smaller quantities of the Pfizer / BioNTech vaccine by Victoria Pharmaceuticals (VP), the regional HSC licensed pharmaceutical manufacturing facility. This process was underpinned by a technical agreement between DH and VP, with onward distribution via the contract distributor. The availability of smaller packs was particularly useful for smaller GP surgeries where full packs of vaccine could not be used within the short expiry date applied to the product post thawing. Consumables

required for the smaller pack size were also packed down and delivered along with the required vaccine quantities.

The Regional Emergency Preparedness Pharmacist (REPP) on behalf of the DH / PHA RP and the RPhPS undertook analysis of transportation temperature and timing to ensure that the delivery to and collection of vaccine from VP did not breach product storage temperature requirements or transportation duration time limits.

There were logistical challenges due to there being no local Regional Pharmaceutical Quality Assurance service (RPQAS) support within the VP pack down site which meant staff had to work across site and amend work-plans based on delivery and pack down of products. Liaison with the contract distributor to establish the correct defrost time in order to ensure accurate expiry date as part of the pack down operation was a key component of this process.

6.6 Vaccines Management System (VMS)

In early 2021 the Vaccine Management System (VMS) was developed. This was a single database of Covid-19 vaccinations for the entire population of NI. This allowed vaccine uptake figures to be assessed in real time and included information on the number of vaccinations administered and the clinical risk groups being vaccinated. This also helped promote patient safety by updating clinical records in real time and so mitigating the risk of inadvertent double vaccination by different providers. The VMS supported dashboards created by the PHA to allow interrogation and analysis of the programme. However, it took time to establish the key metrics and data required for surveillance of the programme and in the initial rollout multiple sources had to be used and cross referenced.

Initially, three different VMS apps (front ends) were developed for data entry, one each for Trusts, GPs and community pharmacy respectively.

In the early versions of the VMS text entries were required for vaccine batch numbers, expiry dates and patient identifiers. This was replaced with drop down menus, limited list selections and a user edit function in later versions. When the app was released to community pharmacies in March 2021, it had several improvements over the Trust and GP apps including linkage to the H&C index and drop down menus/radio buttons for more consistent data entry. Pharmacies now have access to edit and correct their VMS entries so data quality is improved. The pharmacy app was later implemented as the single application for all providers. This facilitated accurate reporting of the service, which involved the linkage of the many individual community pharmacies to the national VMS. Subsequent data monitoring indicated that community pharmacy record keeping was more timely, complete and accurate than that of other providers.

The IT systems for community pharmacy are not centrally procured as they are for GP clinical systems and currently sit outside the (HSC) network. This caused issues when trying to enable the VMS system, however these issues were subsequently resolved to a limited degree with support for Multi Factor Authentication and VMS agreed.

7 Pharmacy workforce issues

7.1 Capacity

The pharmacy workforce in all sectors experienced continual pressures throughout the Covid-19 pandemic. These were compounded by pre-existing workforce shortages as reported in the DH's Pharmacy Workforce Review 2020[2]. Covid-19 vaccination work was prioritised but demand from all other work areas continued and expanded in some cases. Key workforce factors during the Covid-19 vaccination programme which impacted on workforce capacity included:

[2] Pharmacy Workforce Review 2020, Department of Health NI. Available Pharmacy Workforce Review 2020 | Department of Health (health-ni.gov.uk)

7.1.1 Changes to service

Introduction of the Covid-19 vaccination service sometimes required diversion of members of pharmacy staff from their primary duties to provide the service, while other staff involved continued to carry out their primary roles whilst working on the programme. In the majority of settings, it was not possible to secure additional staff to fully back fill the workload involved in vaccination clinics so the additional workload was absorbed by current staff. This was made possible by current staff working additional hours (including evenings and weekends), recently retired staff returning to work and a downturn in some pharmacy activity (e.g. theatre closures, clinic closures, stand down of non-core community pharmacy services). There were also additional Covid-19 work streams requiring pharmacy input e.g. rollout of Covid-19 therapeutics. Within the Trusts there was a requirement to send pharmacy staff to work in the regional MVC at SSE arena on a rotational basis in addition to their own vaccination centres.

Setting up a new vaccination service required significant effort, including: pharmacy staff training on new processes, vaccination training (receipt and provision), basic life support, CPR and treatment of anaphylaxis, needle stick injury and spillage of bodily fluids; the set-up of clinics in new locations; longer opening hours; creation of processes for managing bookings; managing records; and, additional reporting requirements.

The Covid-19 vaccination programme was implemented as a 7-day service in the Trusts; vaccination centres initially operated extended hours e.g. 8am-8pm seven days a week, all year round except Christmas Day. In many cases community pharmacies ran additional clinics outside normal hours. Vaccines required routine picking and packing by the contract distributor at weekends and bank/public holidays and occasional processing of orders from Trusts by RPhPS at these times. The programme continued with extended working hours for nearly two years which affected the ability of staff to take annual leave and resulted in a requirement for Trusts to pay overtime/additional hours.

In community pharmacy, some pharmacies who were previously able to operate with one pharmacist often required a minimum of two pharmacists to maintain pharmacy service provision while vaccination clinics were underway.

7.1.2 Goodwill

The enthusiasm of vaccination providers to support the vaccine rollout and the good will of pharmacy staff were key factors in the success of the vaccination programme. Staff in all sectors often worked additional hours, had pride in what was achieved and felt they were making a real difference to the health and wellbeing of the population. Staff perks (e.g. complimentary meals) provided at Trust sites helped to maintain good morale.

7.1.3 Absenteeism

There was typically a higher level of absenteeism during the Covid-19 pandemic due to staff isolating, shielding, lack of childcare, general sickness and burn out. It is important to note that community pharmacy staff isolation guidance remained aligned to guidance issued by DH for professionals in other areas of the health service, and while advice on testing and isolation was no longer in place in other retail-type settings as the pandemic progressed and restrictions eased, it remained applicable in community pharmacy settings, which contributed to continued workforce capacity issues.

7.1.4 National protocols

The development and issue of vaccination protocols by DH and later SPPG, in line with provisions set out in Regulation 247A of the Human Medicines Regulations 2012, facilitated the use of an expanded workforce to support vaccination including non-registered staff such as pharmacy technicians, pharmacy undergraduates and Foundation Year Trainees (FYT). The use of this expanded workforce in community pharmacy helped to ease pressures on the registered pharmacist workforce by

allowing non-registered staff to support the vaccination process under the supervision of a registered pharmacist.

The use of vaccination protocols also provided a legal mechanism for Ministry of Defence staff to administer vaccinations once patients had initially been screened by HSC clinical staff at the SSE MVC. In contrast, there was some reluctance in some Trusts to fully utilise vaccination protocols, with significant pressure applied on occasion to use vaccination protocols which were felt to require a lot of work to appraise and implement for a low return for this additional effort; for example, only two vaccination doses in the Western HSC Trust (WHSCT) were administered using a vaccination protocol.

7.1.5 Re-allocation

Redeployment was used to assist with workload, however in some cases this may have been for a couple of months and wasn't used extensively. However, due to a downturn in some other areas of health service activity such as elective care, some pharmacy staff time was able to be re-allocated to support the vaccination programme.

Arrangements were put in place for community pharmacy contractors to access vaccinators trained and supplied by the PHA, however the benefit to workforce capacity was limited as they could not be fully utilised during this time period due to issues with contracts and indemnity which were not able to be quickly resolved.

7.1.6 Temporary registrants

In April 2020 the PSNI opened the Covid-19 Temporary Register. This permitted pharmacists who had withdrawn from the register within the last three years to return to practice. The purpose of the Covid-19 Temporary Register was to increase capacity of the pharmacy workforce and support the continued provision of pharmacy services during the pandemic.

7.1.7 Funding

Additional funding for community pharmacy was made available at the start of the pandemic to support the continued provision of community pharmacy services, which was welcomed by the sector. This funding was essential to meet the costs of providing services throughout the pandemic. Other measures were introduced which contributed to staff wellbeing including arrangements to facilitate delayed opening and lunchtime closure, which enabled pharmacy staff to benefit from rest breaks.

At the outset, time was required to establish the vaccination fee structure available to community pharmacy in NI. The funding available to inform negotiations between SPPG and CPNI was linked to corresponding funding paid to other vaccine providers within NI such as GPs, as well as equivalent vaccination services in Great Britain.

Additional funding was also provided to HSC Trusts for Covid-19 pressures which facilitated extra overtime for staff and reduced financial pressures on employers. Available funding for pharmacy staff was non-recurrent in nature and there was little opportunity for pharmacy to recruit agency/bank staff that could be stood up and down like other professions. A small number of bank staff were recruited through workforce appeals in the WHSCT. Conversely, the majority of pharmacy and pharmacy support staff working in the SSE Arena MVC were successfully recruited via the workforce appeal. This was useful to attract staff to the programme who could work in the SSE Arena MVC around other job commitments and was administered via temporary bank contracts. While this expanded the capacity of the pharmacy workforce it also led to fluctuating, unpredictable workforce availability and an additional recruitment workload carried out by pharmacy staff which would normally be conducted by HR staff.

7.1.8 Skill mix

The Covid-19 vaccination programme provided roles for everyone within pharmacy; pharmacists, technicians, pharmacy assistants, pharmacy undergraduates, Foundation Year trainees and admin staff.

The ability for community pharmacy and HSC Trust vaccination providers to employ final year undergraduate students such as pharmacy and medical students, as well as Foundation Year pharmacy trainees, was valuable in being able to expand the available workforce to complete specific vaccination tasks under the approved vaccination protocols.

The CPVS was able to utilise a highly skilled pharmacy workforce that had some prior experience of providing flu vaccinations. While extra training was required to deliver the vaccination programme at a larger scale as indicated above, the training burden was significantly less than would have been required by a less skilled workforce.

7.1.9 Co-administration of influenza and Covid-19 vaccination

From Autumn 2021 the influenza vaccine and the Covid-19 vaccines were co-administered where possible. Whilst this made each individual vaccination appointment longer it realised efficiencies overall and reduced the need to run repeat clinics, reducing the overall workload burden on pharmacy vaccination teams.

7.2 Public attitude

The vast majority of the public were positive about the vaccination programme. However, negative behaviour from a small section of the public who held anti-vaccine beliefs proved difficult for some community pharmacies to address in the absence of clear guidance as to when/how they may withdraw other core services from patients who were threatening or abusive. Pharmacy teams in all sectors sometimes had to

deal with irate members of the public who presented for vaccination but were not yet eligible, these encounters that could be distressing for the staff involved.

7.3 Health and safety

Health and safety risk assessments were completed for staff working within cold room environments in order to maintain limitations on staff time within that environment. At the start of the vaccination programme dry ice was used to maintain ultra-low temperatures for transit of the Pfizer / BioNTech vaccine. Systems for the safe handling and disposal of this had to be implemented by the vaccine contract distributor and vaccine recipients, as such COSHH risk assessments had to be completed and training provided for staff.

The provision of PPE to the HSC was overseen by the Business Services Organisation Procurement and Logistics Service (BSOPaLS). BSOPaLS worked closely with MOIC and Regional Infection Control to develop a new procurement process to purchase PPE of appropriate quality. This facilitated vaccination services by ensuring that pharmacy staff had access to appropriate PPE for the close contact nature of vaccination.

Pharmacy teams within SPPG and HSC Trusts led any Serious Adverse Incident (SAI) investigations relating to vaccine administration errors.

At MVCs safety huddles were employed at the start of each shift, and pharmacy staff engaged with these to ensure changes in procedures or products were clearly communicated to all staff.

8 Reflections and lessons learned for future vaccination programmes

Respondents identified a number of areas that should be considered in terms of lessons learned for future vaccination programmes, which are summarised below:

8.1 Communication

I. Pharmacy involvement at all levels including strategic and operational planning at national, regional and local levels was essential to the safe and effective deployment of novel vaccinations. Timely information about the pharmaceutical characteristics of vaccines was essential to inform decision making about deployment models.

II. The establishment of small, knowledgeable core teams which were networked effectively with larger multi-stakeholder groups was essential. Regular minuted meetings were essential in maintaining the flow of information and disseminating to wider sub-groups. Maintaining and establishing good working relationships helped when working under pressure to tight deadlines.

III. Close collaboration and timely information sharing between all stakeholders to provide safe and effective deployment of novel vaccines to the population was necessary. Timely flow of information to healthcare providers first before the general public was essential to allow time to implement new SOPs and order vaccine stock and mitigate public disappointment.

IV. The use of regional Trust SOPs, screening and administration forms may have reduced workload for pharmacy teams and supported safety and efficiencies through having standardised processes across Northern Ireland.

V. The use of HSC secure email provided an extra barrier to some community pharmacies, as the requirement to regularly access their accounts to check for new and updated information was challenging due to the fast paced nature of changes and the high workload.

8.2 Business development

I. The importance of planning, testing and developing Business Continuity plans, quality systems and updating these where necessary. Where these were available they were used to test scenarios and to help deliver the Covid-19 vaccination

programme in a timely and effective way. Robust Business Continuity Plans should be tested periodically as part of business continuity planning.

II. The feasibility of including vaccination administration training in the Pharmacy undergraduate course in NI could be explored. This will help to ensure that the future pharmacy workforce has the competence to deliver on future vaccination programmes.

8.3 Workforce capacity

I. The welfare of pharmacy teams is of paramount importance. Timely access to wellbeing support should be in place for all pharmacy staff in each sector.

II. Consideration should be given to standing down non-essential work to allow prioritisation of the vaccination programme delivery, where feasible.

III. Availability of additional staff to work in the vaccination programme would have been helpful to alleviate some of the workforce capacity issues and pressures on other pharmacy services. Given the emergency nature of the vaccine programme, recurrent funding was not available at the start of the Covid-19 vaccination programme which made it challenging to recruit and retain staff in this area.

IV. Consideration should be given to availability of a regional shared workforce that can be accessed to support implementation of regional vaccination initiatives such as mass vaccination centres.

V. Full utilisation of all available mechanisms for broadening skill mix, such as use of vaccination protocols, should be progressed to alleviate the burden on the registered healthcare professional workforce.

8.4 Vaccination service considerations

I. The Covid-19 vaccination programme was most effective when the public had a choice of vaccination providers as this facilitated clearer public messaging. Consideration should be given to ensuring that community pharmacies are able to vaccinate the same cohorts of individuals as other vaccine providers such as GPs.

II. Community pharmacy should be prioritised for deployment of single dose preparations of Covid-19 vaccines as they become available, as this would facilitate opportunistic vaccination of hard-to-reach populations in the pharmacy setting.

III. Community pharmacies have demonstrated an ability to contribute to large scale vaccination programmes and provide an accessible route to vaccination, particularly for hard to reach populations, and they should remain at the forefront of future vaccination programme development.

9 Conclusion

The vital role played by pharmacy teams in all sectors helped to considerably raise the profile of pharmacy among policy makers, healthcare professionals and the public alike. This raised awareness of the broad skill set that pharmacists possess and those skills were put into action in many different scopes of practice during the Covid-19 vaccination programme. It is important to build on this in future years for other vaccines and medicines more broadly – pharmacy teams should be present wherever medicines are used, in order to optimise patient outcomes.