Healthier Together

Improving health and care in Bristol, North Somerset and South Gloucestershire

Maximising Uptake in the COVID-19 BNSSG Vaccination Programme

Evaluation report

"do people understand, are they empowered and who do they turn to for validation?"

Community Advocate, BNSSG COVID-19 Vaccination Programme

Shaping better health

Name of evaluation	**Maximising Uptake in the COVID-19 BNSSG Vaccination Programme: Evaluation report**
Sign-off Date	August 2021
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Abbreviations

BNSSG	Bristol, North Somerset, South Gloucestershire
CCG	Clinical Commissioning Group
GRT	Gypsy, Roma, Traveller
HCW	Health Care Worker
ICS	Integrated Care System
LD	Learning Disabilities
LSOA	Lower Super Output Area
MECC	Making Every Contact Count
PCN	Primary Care Network
SMI	Serious Mental Illness
SOP	Standard Operating Procedure
SWD	System Wide Dataset

Executive summary

The COVID-19 vaccination programme in Bristol, North Somerset and South Gloucestershire (BNSSG) had equity at the core of the strategy from the planning stages. It aimed to leave no-one behind, particularly those at higher risk of severe illness and death from COVID-19. The programme combined strategic oversight with operational groups, and structures to provide governance within this. National evidence on COVID-19 risk, and population factors affecting vaccination uptake was combined with BNSSG population health data on influenza vaccination uptake to identify the following priority groups for maximising uptake work:

- Group 1: People with experience of homelessness
- Group 2: Non-English first language speaking, minority ethnic groups, refugees, asylum seekers – particularly focussed on Bristol Inner City (BIC) Primary Care Network (PCN)
- Group 3: Those living a distance from a vaccination centre/rural communities/deprived populations/Gypsy, Roma, Traveller/Boating community
- Group 4: Hospital patients
- Group 5: Those who may struggle to access vaccination centres – people with Learning Disabilities, Serious Mental Illness, Drug & Alcohol dependence, physical disabilities including visual and sensory impairment

Table 1 describes the elements of the programme. This work has taken place concurrently and iteratively to feed rapid learning into the programme and identify new areas of focus. A dedicated programme manager has co-ordinated the work.

Table 1. Maximising Uptake Programme Elements

Programme Element	Rationale/Impact
Insight work	Identify reasons for low uptake of vaccine and subgroups less likely to be vaccinated Continue to improve on outreach models Develop comms/engagement strategy
Population health management – using data	Identifying groups with high risk for COVID-19, and low uptake of flu vaccines within BNSSG to prioritise equity work Mapping groups geographically and to healthcare services e.g., PCNs Iteratively testing approaches and re-evaluating priorities
Communication and engagement	Using trusted sources of advice regarding the vaccine Using most effective language and people to deliver messages Comms via local media platforms, organisations & communities Building trust and partnership working with communities
Outreach work	Pop up clinics Housebound visits Vaccinating through existing support services, including working with PCNs Taking the vaccine to vulnerable groups/individuals Making adaptations to Large Scale COVID-19 vaccination centre

Outcomes

From March – end May 2021, **outreach clinics run by Sirona care & health, PCNs, community partners and other providers delivered 2,567 first dose and 715 second doses.** Subsequently, large walk-in clinics delivered high numbers per clinic, totalling over 4,500 to end June 2021. In addition, Sirona care & health delivered administered **1,781 vaccines (first and second doses) to housebound patients** Jan – June 2021. **Primary Care Networks (PCNs)** deliver most of the vaccines within the wider programme and have been crucial to delivering vaccines to those within priority groups too, working to identify and support those in the priority groups, alongside outreach and walk in clinics from within practices. The **large-scale vaccination centre** has also adapted its way of working for some of the priority group's needs, for instance scheduling sessions for minority community members to attend together.

For some priority sub-groups such as Somali and South Asian language speaking community's vaccination uptake figures have trended up towards BNSSG average, with trends coinciding with outreach and engagement activities. This includes pop up clinics, however also including additional support, for instance the Sirona care & health HealthLinks workers who have provided translation services and reassurance to people attending for vaccination. In the complex context, it is difficult to attribute cause and effect, however insight work shows that vaccination decisions are mostly driven by influence within community networks. It is therefore likely that both the engagement work and outreach work had wider impact than is indicated by the doses delivered in the outreach clinics. Not all subgroups have been straightforward to make progress with, and for some such as the Eastern European population, different routes of engagement have been needed from the initial approaches.

Whole programme costs (including communication and engagement work) are estimated at **£15 additional health service cost per dose delivered in outreach** to end May 2021. This is likely to be cost-effective to the NHS considering the prioritisation to high-risk individuals less likely to be vaccinated, and the effectiveness of vaccination at preventing high-cost hospital admissions. Note costs here are calculated before the larger walk-in outreach activities, which are likely to have reduced cost per dose, and do not include the benefits of those who were vaccinated within the mainstream system because of the maximising uptake programme. They also do not include the cost of volunteers' time.

Summary recommendations from the evaluation

Recommendations for the vaccination programme:

1. Maximising uptake must remain a priority. To allow cost-effective interventions, we need to continue to re-evaluate our maximising uptake strategy and processes with iterative use of Population Health Management tools (data) and insight work on:

- Resources
- Prioritisation of priority sub-groups
- Methods of engaging with people or groups where we've had less success so far

- Support for partners including PCNs

2. We must anticipate potential issues in the programme:

- Potential lack of resilience in a rapidly developed programme reliant on committed individuals
- Rising workload around other health and care issues
- Combination of Influenza and COVID-19 vaccines – changing delivery models and uptake factors

Recommendations for the wider BNSSG system:

3. Continue to strive for equity of health outcomes for the BNSSG population, using and developing on effective ways of working within the maximising uptake programme

- Co-production with communities – giving them ownership to develop engagement and deliver outreach
- Working across the BNSSG integrated care system, combining strategic oversight with professionals with in-depth knowledge, experience, and trusted relationships with underserved groups
- Providing governance that supports flexible, innovative, rapid ways of working
- Investing in insight work, communications expertise and use of population health management data tools

4. Continue to develop the BNSSG approach to reducing health inequalities, considering wider health and social care issues for different patient/population groups, and how we develop “inclusion health”.

Contents

Introduction

There is both a local and national need to rapidly learn from the efforts taken to improve COVID-19 vaccine uptake. The BNSSG mass vaccination programme needs to understand what works and how effective the interventions are, to plan for the remainder of this vaccine campaign and for future COVID and non-COVID related campaigns. Quality Improvement (QI) methodology uses the steps described in Figure 1. These have been part of the programme and describe the role this evaluation plays in feeding back into it.

Figure 1. Quality Improvement methodology.

This evaluation is part of a wider evaluation strategy, developed and delivered by those named below. This report will cover the programme elements, the process learning and the effectiveness, both for the whole maximising uptake programme, and for the subgroups. Recommendations from this evaluation are given. Additional data is included in the appendices.

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With thanks to those not named above who gave their time to share learning from their experiences and contribute to the evaluation, and acknowledgement of the hard work of all involved in delivering the wider BNSSG vaccination programme.

Background

The COVID-19 pandemic has both revealed, and worsened, health inequalities. The most vulnerable individuals in society have been those most at risk from the direct and indirect consequences of COVID-19 infection[1]. This includes Minority Ethnic Groups, people experiencing homelessness and deprived populations in general, who are also less likely to receive vaccines.

The Healthier Together COVID-19 Mass Vaccination Programme covers the geographical area of Bristol, North Somerset and South Gloucestershire (BNSSG) population of almost 1 million.

The vaccination programme is unprecedented in size, pace and context. The circumstances have driven innovation and meant there has been a shared BNSSG-wide system priority. Equity has been a core part of the strategy from the planning stages. The vision of the Mass Vaccination Programme is to vaccinate all eligible people in BNSSG. It aims to leave no-one behind, particularly those at higher risk of severe illness and death from COVID-19.

Partners within the Bristol, North Somerset and South Gloucestershire (BNSSG) health and care system have worked together in new ways, and also with communities. Multiple interventions were developed both for engagement and outreach. These include vaccine myth-busting webinars[2], community language videos, community-led clinics and mobile outreach. The programme continues to evolve and there is a need for continued learning, as well as identifying wider learning for the BNSSG system.

Aims and objectives

Aims and objectives of the evaluation were developed in a multi-stakeholder evaluation working group. They reflect learning needs for the vaccination programme ongoing, and wider system needs including capturing innovative ways of working and reducing health inequalities.

Aims

- To understand how engagement and outreach interventions were developed and implemented
- To determine which interventions were effective, how cost-effective they have been, and for which groups

Objectives

- To describe the processes and range of activities in the outreach/engagement programmes
- To use available data to evaluate the effectiveness of the maximising uptake programme
- To gather process learning from patients, community leaders, programme staff on facilitators and barriers to success
- To describe and build on the rapid learning system
- To explore cost-effectiveness, relative to PCN sites and large-scale vaccination sites
- To build recommendations for programme development, specifically considering sustainability and adaptability to other health and social care issues

Methods

Evaluation strategy

The evaluation was commissioned by the BNSSG Mass Vaccination Clinical Delivery Group (CDG) and BNSSG CCG. There are different parts to the evaluation and a multi-stakeholder vaccination evaluation group was formed which steered the evaluation, agreed aims and objectives, outputs and dissemination routes. This evaluation report sits alongside Quality Improvement work for sharing locally and more widely. Due to the need to learn from the

programme beyond vaccines delivered, process interviews were undertaken with over 30 people working in the programme and from communities. Further quantitative evaluation is also underway, with an aim to publish findings in peer-reviewed journals. Every attempt has been made to include relevant individuals and organisations; however, this is also a rapid evaluation to inform the ongoing vaccination programme. If you would like to feed into evaluation work, please contact the main author K Hamilton (Kathryn.Hamilton@nbt.nhs.uk).

Evaluation approach

The mass vaccination programme is unprecedented and in a unique time of national emergency and population lockdown. It is not easy to attribute changing uptake patterns to engagement interventions in this context; there are many national and local contextual factors to consider alongside the activities undertaken. Similarly, although numbers of vaccinations delivered in outreach settings have been described, and trends in uptake in priority groups have been mapped against outreach activities, most of the evidence for impact is observational and limited. Only the direct impact of doses delivered in outreach can be stated with certainty. There will be secondary impacts, as influence spreads within community networks, and these are much harder to quantify.

However, the uptake data sit alongside the insight data, and the evaluation interviews and these sources have been brought together here to examine impact and identify facilitators and barriers to success. Further, we make recommendations for adaptation of the work within this programme and how it might apply to other healthcare needs of these groups.

Data sources

There is a wealth of routinely collected data in the health service that can be used for evaluation purposes. However, when evaluating a novel approach to service delivery there is a need to collect new additional data, often qualitative in nature. Table 2 shows the data sources and time periods this data relates to that have been used in the COVID mass vaccination evaluation.

Table 2. Data sources for the evaluation

Data source	Data description	Time period
Population Health Management data from BNSSG CCG	Quantitative population data including: -population factors affecting vaccination uptake -mapping of population COVID-19 risk -influenza vaccination programme outcomes 2020/21	September 2020 – June 2021
Local and national vaccination uptake data systems, supplied by BNSSG CCG	Vaccination uptake data for BNSSG and priority sub-groups	Dec 2020 - ongoing
Maximising Uptake Programme leads, BNSSG CCG, Sirona care & health	Outreach and engagement activities Vaccinations delivered within outreach settings Costs for maximising uptake programme activities	Dec 2020 – May 2021

Interviews with 30-35 programme and community leaders	Process evaluation to identify facilitators, barriers, describe ways of working, and consider adaptability and sustainability	May-June 2021
BNSSG CCG Insights team	Insight work including before and after outreach/engagement surveys, online public surveys and interviews with priority groups	Dec 2020 – May 2021

The process interviews were carried out by K Hamilton, using a structured interview guide (see Appendix 1), and analysed using qualitative research methodology by K Hamilton and C Holloway.

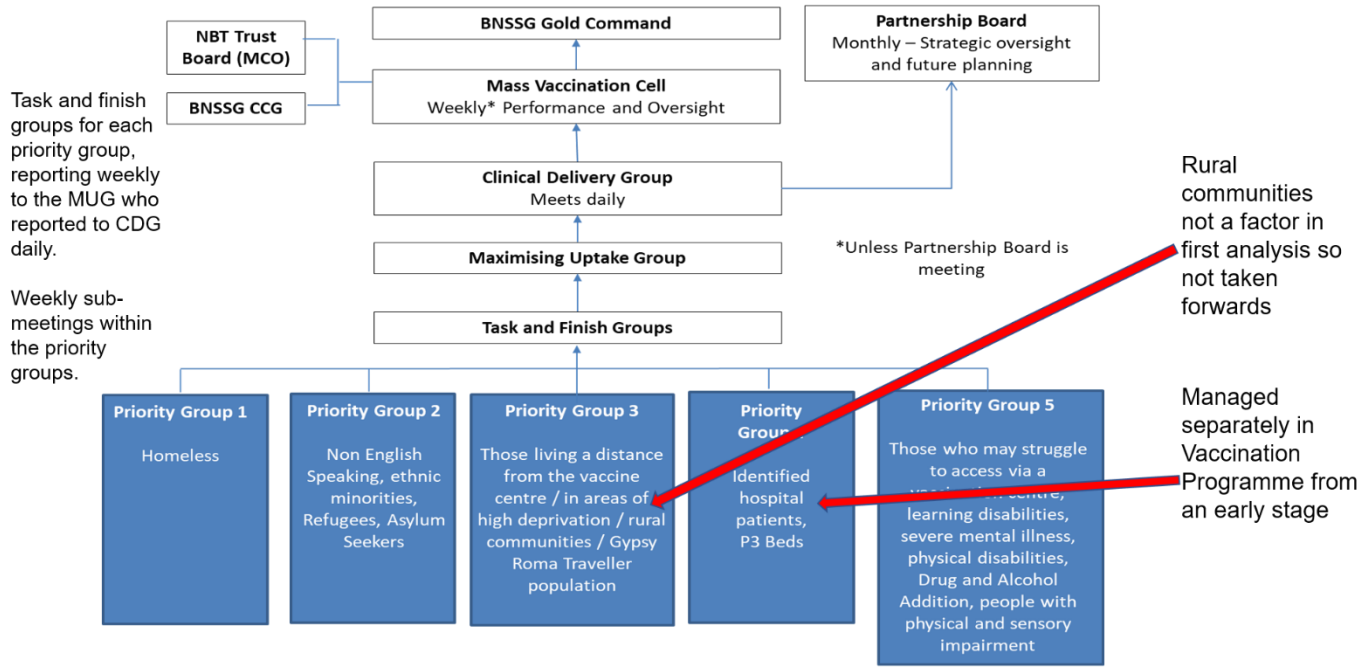
Results

Maximising Uptake Programme

Figure 2 (page 10) shows the structures within the maximising uptake programme. It provides a system for strategic oversight, governance, partnership working, problem solving and sharing operational expertise. This structure has developed over time, reflecting the need within the uptake data, and work as well as populations can cross between groups. The Maximising Uptake Group (MUG) was set up with people of influence and experience from public health, local authorities, acute, primary and community NHS care providers and data and research commissioning colleagues.

The strategy to achieve the aim of increasing vaccination rates has been multi-faceted, evolved over time, and tailored to different priority groups. To identify priority groups, local and national evidence was combined with insight work, local experience with other similar programmes (influenza vaccinations) and grassroots knowledge and experience from communities and programme workers.

Figure 2. Structure of the maximising uptake programme and priority groups



There are many examples of QI (Quality Improvement) methodology in development of the programme; for instance, early efforts around flu vaccine pop up clinics provided a potential theory of change, feeding into the COVID-19 strategy. The driver diagram in Appendix 2 was used to break down steps required to achieve overall programme aims, and application of generic QI methodology to a complex multi-faceted health and care problem.

Partners involved in the maximising uptake work are summarised below

- **PCNs** – delivering most vaccinations within the BNSSG mass vaccination programme and working with the maximising uptake team to deliver outreach clinics and increase vaccinations for their practice populations
- **Sirona care & health** – community provider of multiple existing services, leading on delivering vaccinations in outreach community settings, and mobile outreach to underserved groups. Providing specialist input e.g., to the Learning Disability service, with HealthLinks workers also supporting the vaccination programme
- **Large Scale vaccination centres** – delivering vaccinations at scale for the mass vaccination programme, and working with other partners to make adjustments for the priority groups, including vaccine coaches
- **North Bristol Trust/University Hospitals Bristol and Western/Avon and Wiltshire Mental Health Partnership NHS Trust** – vaccinating healthcare staff, North Bristol Trust initially leading the Clinical Delivery Group, and AWP supporting priority group 5 strategy
- **BNSSG Clinical Commissioning Group** – in collaboration with OneCare, providing analysis of population health and uptake data to guide strategy and review progress, alongside insight work and communications
- **Local authority, including public health teams in local authority settings** – Bristol, North Somerset and South Gloucestershire working to understand local population needs, develop strategies and provide resources for maximising uptake work, including community health champions
- **Voluntary sector** with multiple charities who support the maximising uptake work for under-served groups**, and community groups & settings** e.g., Local Community Faith Groups, Bristol & Avon Chinese Women's Group, Malcolm X Centre, Barton Hill Wellspring Settlement
- **Other community providers** – e.g., Drug and Alcohol services, Homeless Health Service and Borderlands, amongst many organisations working with the maximising uptake team
- **Public Health England** – regional and national networks including Screening and Immunisations Specialists

The main elements of the programme were: population health management (using data), insight work, communications and engagement and outreach (see Table 1, page 3). In the following sections these programme elements will be considered in turn, followed by outcomes for the whole programme. Results for individual priority groups are summarised and are given in more detail in Appendices 5 – 8.

Population health management

"true iteration to the approach, continually learning and adapting" Programme process interview

In BNSSG the CCG has access to the System Wide Dataset (SWD) – this contains primary care records for most residents who are registered with a GP. National and local vaccination uptake data were used, alongside baseline population data from the SWD to develop an evidence-based approach to:

1. Understanding risk: creating a BNSSG population COVID-19 risk profile at small area level (categorising Lower Super Output Areas by their population make up) and for individual priority groups (SMI/homeless)
2. Predicting vaccination uptake rates using flu uptake data
3. Reviewing real time (monthly) uptake data to identify priority groups and geographical areas falling behind
4. Reviewing approaches and priorities to maximise uptake, including understanding small areas/PCNs with lower uptake

Risk profiling which includes risk of severe disease, transmission, and low vaccine uptake. Risk of severe disease and transmission was based on ALAMA COVID-19 scoring. This calculates "COVID age" for individuals based on published risk factors and assessing "vulnerability": risk that someone will (a) get infected and (b) develop serious illness[3]. Please see Appendix 3 for ALAMA risk scoring for the BNSSG population. There is also good evidence in the published literature of increased COVID-19 risk and poorer health outcomes from a range of causes for socially disadvantaged groups including people with experience of homelessness, asylum seekers, refugees and undocumented migrants[4, 5].

The approach to identifying groups less likely to be vaccinated was to combine the published evidence-base with local evidence. Published evidence shows that there are many factors involved in the decision to be vaccinated, as demonstrated in Figure 3.

Figure 3. Factors affecting vaccine uptake identified in peer-reviewed literature and international guidance[6].

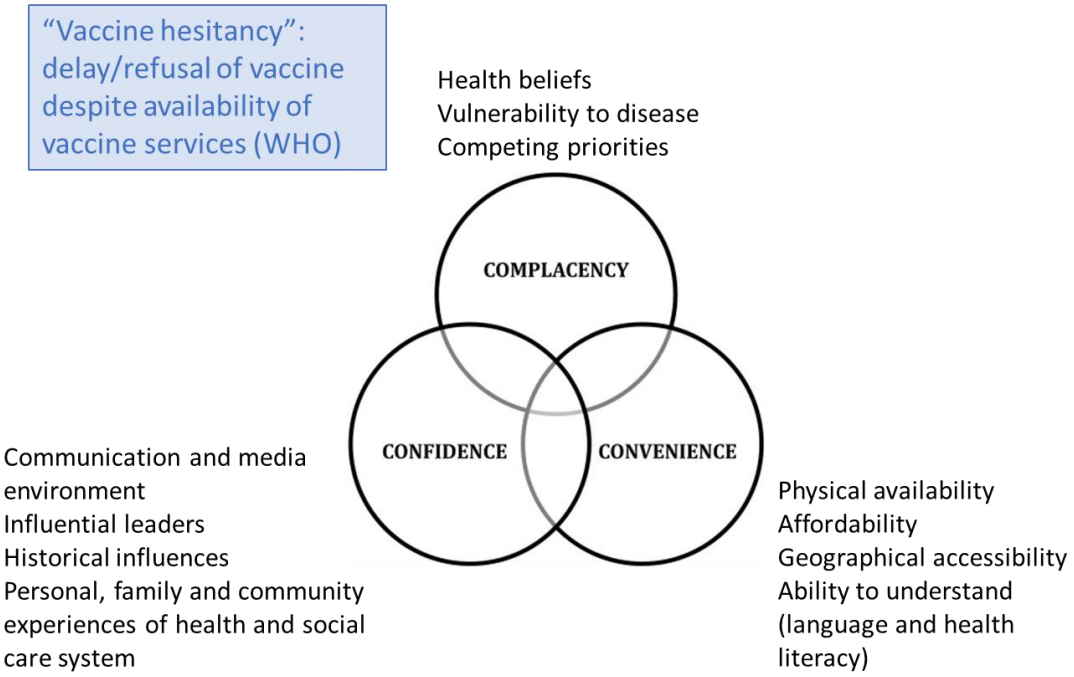


Figure 4 shows uptake data from the 2022/21 influenza vaccination programme. The BNSSG population was categorised at LSOA level by levels of ethnic diversity and deprivation. This allowed geographical mapping, and understanding of communities, as well as accommodating incomplete recording of ethnicity in the dataset (around 75%). Analysis showed lower flu vaccine uptake for areas with higher levels of deprivation and ethnic diversity, relative to the BNSSG average, and validated locally the identified factors. This information was then mapped geographically (see Figure 5), including linking to PCN site, and large-scale vaccination sites.

Figure 4. Uptake of influenza vaccination in BNSSG by levels of ethnic diversity and deprivation. The additional brown line (highest uptake curve) shows uptake for those with a coded learning disability.

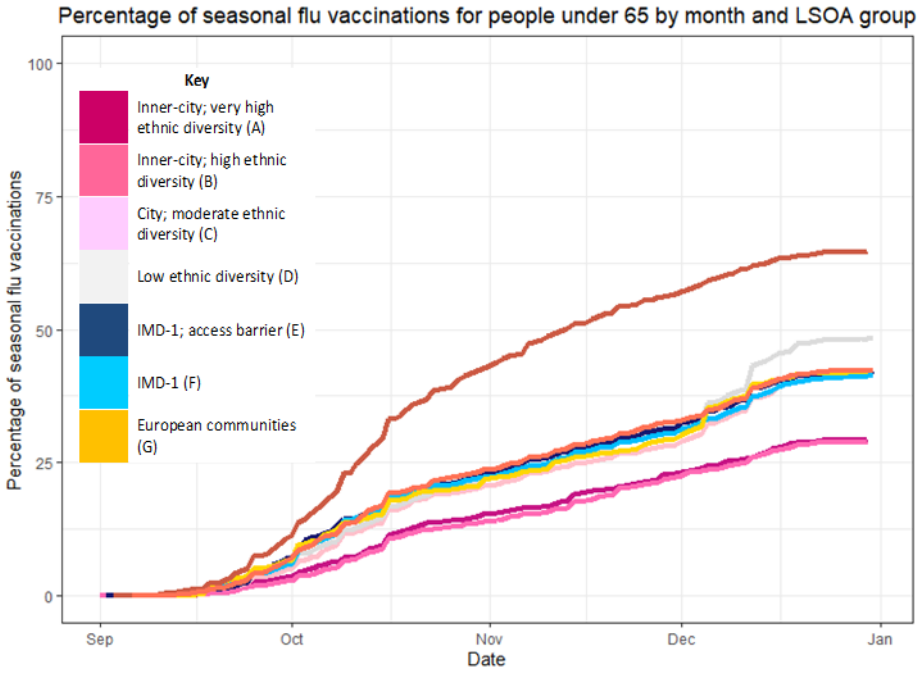
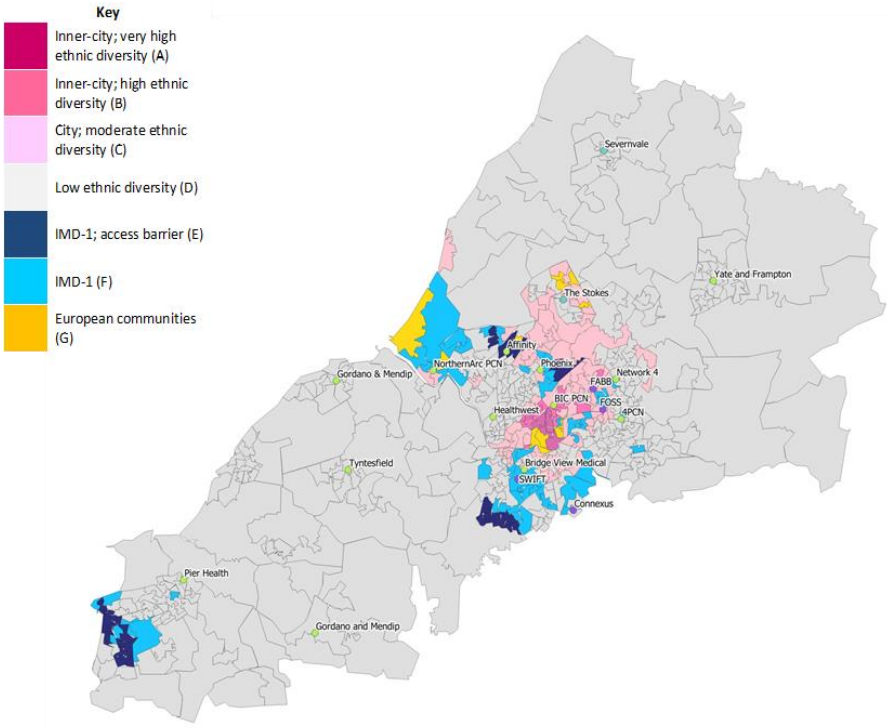


Figure 5. Mapping of BNSSG by Lower Super Output Area (LSOA), categorised by levels of ethnic and linguistic diversity, deprivation (IMD-1: most deprived) and access barriers to initial designated vaccine sites (as measured by travel time)



Taking this approach of mapping population factors, the team were able to look at factors such as travel time by PCN to vaccination centres taking into account the average level of deprivation in that PCN population (see Appendix 3). As discussed in outcomes, uptake data were also regularly reported to the programme, with review of the priority groups and sub-groups within.

Reflections on the facilitators and barriers to the use of population health data are shown in Box 1.

Box 1. The facilitators and barriers to the use of population health data – process learning from interviews with programme workers

Facilitators to using population health data effectively included:

- The System Wide Dataset – across BNSSG with patient-level data from primary care
- COPI notice – allows use of patient data for purposes related to diagnosing, managing and controlling the spread of communicable disease
- Data sharing between CCG and OneCare, e.g., flu vaccination status
- Adding data analysis/software skills to CCG team
- Group for data-management: CCG, OneCare, Local authority
- Integration into other groups e.g., regular attendance at CDG to respond rapidly to data asks
- An iterative approach to reviewing risk and vaccination uptake alongside national and local priorities
- Good recording of variables like ethnicity in the dataset, that are often under-reported in health data

Barriers in effective use of population data included:

- Poor recording in the primary care dataset of some variables: e.g., "homelessness" is variably interpreted and poorly documented
- Some people remain invisible to the system, and due to social vulnerability factors, they may be those in higher COVID-19 risk categories. This may include refugees, asylum seekers, gypsy roma travellers as well as people who have opted out of data-sharing of the GP record
- Data sharing between some organisations takes time and specific data sharing agreements

Insight work

Insight work from Dec 2020 to May 2021 included:

- The citizens panel (electronic survey)
- BNSSG public survey (electronic survey)
- Interviews with people with experience of homelessness, members of Gypsy Roma Traveller and boating communities
- Pre- and post-event surveys for webinars
- Vaccination outreach clinic surveys
- "Jamboard" from community clinics
- Shared learning from South West CCGs and national forums

Key findings that informed the planning included the Citizen's panel Dec 2020. This showed a significant minority of around 10% said they were either unlikely to accept vaccination, or unsure.

The biggest factor in someone's decision is speaking with trusted family and friends (see Appendix 4). However, it demonstrated that locally people make vaccine decisions on a range of factors, these vary by group, and are summarised in Table 3.

Table 3. Drivers and barriers to vaccination identified in local insight work

Drivers for vaccination	Barriers to vaccination
Prosocial approach (protection of others) Protection of self Community influence Practicalities: clinic locations, GP access Information (and sources)	Safety Concerns Lack of information Accessibility of vaccination Acceptability or practicality of vaccination locations Vaccine misconceptions Fertility concerns Mistrust of government or other official organisations

As well as informing the programme strategy, insight work during the vaccination programme was used to review and develop:

Outreach:

- Motivations for attending outreach clinics
- Patient experience at an outreach clinic
- Practical suggestions for improved access
- Things that worked well and could be replicated
- Staff needs to deliver outreach clinics effectively
- Comms suggestions
- Non-English language requirements
- Suggestions for addressing vaccine concerns

Engagement:

- Changing views after webinars
- How people share information with others after engagement
- Reviewing engagement methods to refine/adapt/target

Engagement and Communication

"Communicating with people honesty and openly"
Programme Process interview

Key insights from the work described above led to the following communication and media strategy:

- Friends and family, local community and faith leaders, and healthcare professionals from within the community most trusted initial sources of advice regarding the vaccine
- Desire for communication and advice in own language from 'people like me'
- Communication via local media platforms, organisations and communities
- Some patient groups (e.g., homeless) comms work isn't appropriate in the same way

A range of engagement and communication methods were used. They are summarised in Table 4.

Table 4. Engagement and Communication strategies in the Maximising Uptake COVID-19 Vaccination programme to end May 2021

Engagement and communications methods
Community champions (>100 people with influence from e.g., BME and deprived communities) trained on COVID-19 and vaccines
MECC approach training people in libraries, one stop shop (Local Authority), street care
Written and video information in other languages
6 Short videos with community leaders from ethnic minority communities sharing personal experience of how they'd been affected by COVID, worries about vaccination.
Templated posters for fast turnaround production to be used locally – e.g., in clinics encouraging people to share their vaccination experiences; publicity for walk ins; can include community leader quotes
Language Hub on the Healthier Together website of trusted resources in 22 different languages
Revised wording of COVID-19 Vaccine Appointment text message invitations from PCNs using more positively framed language and translated to 8 languages
Webinars developed for ethnic minority and disabled communities, and addressing concerns for pregnancy, breast feeding & fertility, but accessible for all demographics
Small scale Webinars run by communities in own languages - such as in Somali community and by House of Praise, by local PCNs prior to 1st dose clinics also helped to allay concerns and get people signing up for vaccinations once they became eligible
Videos and Leaflets in different languages
Community led videos made by organisations embedded within local communities, often in community language.
vaccinated: Pull-up banners and posters encouraging people to share their experience of being vaccinated with family and friends will be available at all vaccination clinics

The impact of the engagement work is hard to quantify. However, surveys done before and after a webinar event showed that it did increase people's perceived likelihood that they would accept the offer of vaccination (data not shown). It also sits alongside the outreach activity as detailed in the next section.

Outreach activity

The outcomes of the outreach activity March – May are given in Table 5. In the COVID-19 mass vaccination work outreach clinics refer to pop up clinics and other outreach vaccination work organised by those working in and with the maximising uptake programme. Clinics were delivered by Sirona care & health, PCNs, the voluntary sector, other community providers and our community partners.

Table 5. Outreach activity in BNSSG Maximising Uptake Programme to end May 2021.

Outreach activity	Dates of activity	Outcomes – vaccines delivered to priority groups
Outreach clinics delivered by Sirona care & health, PCNs, communities and other providers	March – end May 2021	2,567 first doses
	April – end May 2021	715 second doses
Housebound vaccines by Sirona care & health	Jan - early June 2021	1,781 vaccines (first and second doses)
PCN vaccinations	Ongoing	Unknown – delivering majority of vaccines and doing outreach/engagement work, and housebound visits
Large scale vaccination centres	Ongoing	Unknown – delivering vaccines at scale and working with maximising uptake work to increase accessibility/acceptability to priority groups

Outreach clinics were run depending on the population needs, for instance the Sirona HealthLinks team of multi-lingual staff aim provides interpretation, reassurance and explanation in a range of languages, and were present at community clinics to support and assist clinic users and volunteers. At walk-in clinics, vaccination coaches (part of the mobile team), whose role is usually to speak by phone to people who have concerns or questions about vaccination, were able to speak to passers-by in person, encouraging them to use the service. Many clinics were enabled or run by the community who took responsibility for making appointments and advertising the clinic.

A survey carried out with over 500 people attending outreach community clinics showed that 15.5% had previously been offered an appointment for vaccination, and that 39.3% strongly preferred to attend the local clinic rather than an NHS facility[7]. At one community clinic, 67% said they did not want to attend a GP practice or large-scale vaccination centre for their vaccine[8].

Reflections on the facilitators and barriers to increasing vaccination uptake are shown in Box 2.

Box 2. The facilitators and barriers to increasing vaccination uptake – process learning (interviews) across the maximising uptake programme

Facilitators to successfully increasing vaccination uptake included:

- A shared **commitment** across the system to equity
- A **dedicated programme manager** for the maximising uptake programme
- Novel and iterative use of **population health data** to map population risk, predicted need and capacity to benefit, and feeding into strategy development, prioritisation and testing of approaches
- Investing in **insight** work and communications expertise
- **Learning by doing** and through insight work which helped understand processes, different communities and how to adapt approaches
- Taking a **tailored approach** to different subgroups within the priority groups
- **Partnership working** between BNSSG organisations, communities and individuals, including community providers with in-depth knowledge and experience of working with a priority group
- Effective use of **communication networks** and trying less traditional ways of communicating health messages
- Giving **communities ownership** for engagement and outreach
- **Governance** and reporting structures that support flexible, rapid ways of working and provide forums for sharing/problem solving/planning (MUG, CDG)
- **Committed individuals** working for their populations

Barriers and challenges to increasing vaccination uptake included:

- **Multiple barriers in accessibility or acceptability** of vaccination for these populations. These can be combined with **wider mistrust** of the system and historical or current experience of inequity that undermines engagement
- Individuals or groups who are **not visible in the healthcare system**:
    - homelessness variably recorded and varying definitions
    - people who want to remain off the system:
    - people with no recourse to public funds
- **Communities without clear routes of engagement**:
    - local Eastern European populations: moving towards workplace engagement
    - people who are not co-ordinated communities with clear community leaders: priority group 5
- **Workload for PCNs** – delivering vaccine to these priority groups alongside general practice commitments and rising workload
- Practical/operational issues
    - -co-ordinating vaccination for individuals where **window of opportunity may be brief**
    - -clarity over eligibility for support workers early in programme
    - **-geographically dispersed** individuals with factors reducing uptake e.g., pockets deprivation South Gloucestershire, people with serious mental illness
- **Working with national factors**

Cost effectiveness of outreach activity

Considering vaccines delivered in outreach alone (excluding housebound vaccinations), the maximising uptake programme cost an additional £15 per vaccine compared to vaccinations delivered in the mainstream programme. In general, the item of service fee was also payable for this period. The additional cost covers programme staff, communications, engagement, and facilities for the clinics. The total cost is an estimate, as many involved have worked on the vaccination programme, or within their own organisations, without defined time allotted to the Maximising Uptake work.

Programme costs above do not include the vaccine coaches costs which started at the end of May 2021, and it is more difficult to attribute vaccines delivered by this method. Nor does it include the additional vaccines given within the wider system as a direct or indirect result of the engagement and outreach work of the programme.

Ongoing costs for the programme are likely to differ from this initial period. Initial use of temporary staff will have increased staff costs; however, volunteers have also been heavily involved, and going forwards programme staff are now specifically employed to work on maximising uptake. This is balanced against reduced costs per vaccine due to the item of service fee previously payable for PCN-delivered vaccines. Finally, the outreach model has evolved, and walk-in clinics are now running delivering large numbers of vaccines, likely at a lower cost per vaccine.

Further exploration of cost-effectiveness will be reviewed in the discussion section.

Priority Group Outreach

The vaccinations given by outreach to priority groups are listed in Table 6. There is some cross over between priority group 2 and 3, and outreach activities started after the period included in this evaluation (including walk in and mobile clinics) have focussed on the more deprived communities.

Table 6. Vaccinations given by outreach to priority groups and sub-groups. *housebound vaccinations do not include vaccines given by PCNs, as this figure was not available.

Priority Group	Outreach or engagement activity	Dates of activity	Outcomes – vaccines delivered
Homeless	Outreach clinics and individual outreach	March - May 2021	294 first doses
		April – early June 2021	56 second doses
Priority group 2: ethnic minorities, non-English language, asylum seekers and refugees	Outreach clinics	March – May 2021	2,038 first doses
		April – May 2021	812 second doses

Asylum seekers and refugees	Outreach clinics at temporary accommodation and with voluntary sector	March 2021	235 first doses
		May 2021	23 second doses
Gypsy, Roma, Travellers	Outreach clinics at traveller sites	March – May 2021	78 first and second doses
Housebound patients*	Sirona care & health vaccination outreach	March – June 2021	1,781 first and second doses

Priority Group 1: People with experience of homelessness

There has been a new flow of homelessness related to the pandemic, despite "Everyone In", and there are ongoing concerns around lack of permanent housing options[9]. There is national uncertainty on the impact of homelessness on COVID-19 vulnerability, and deaths in this population are due to be reported in late 2021. However, it's likely that attack rates in homeless settings are high, and many are clinically vulnerable, with already low life expectancies[4]. Local insight work[10] in Nov/Dec 2020 in BNSSG with people with experience of homelessness showed that:

- COVID-19 is a concern for this group, but day to day their lives include many other immediate concerns
- Some express misconceptions and mistrust, particularly towards the government, but most concerns were around safety
- People were more likely than not to have the vaccine, and many wanted more information
- Only a small proportion were decided against vaccination

Varying approaches were taken across BNSSG depending on the local profile of homelessness and existing support services. Key structures and partners specific to homelessness included:

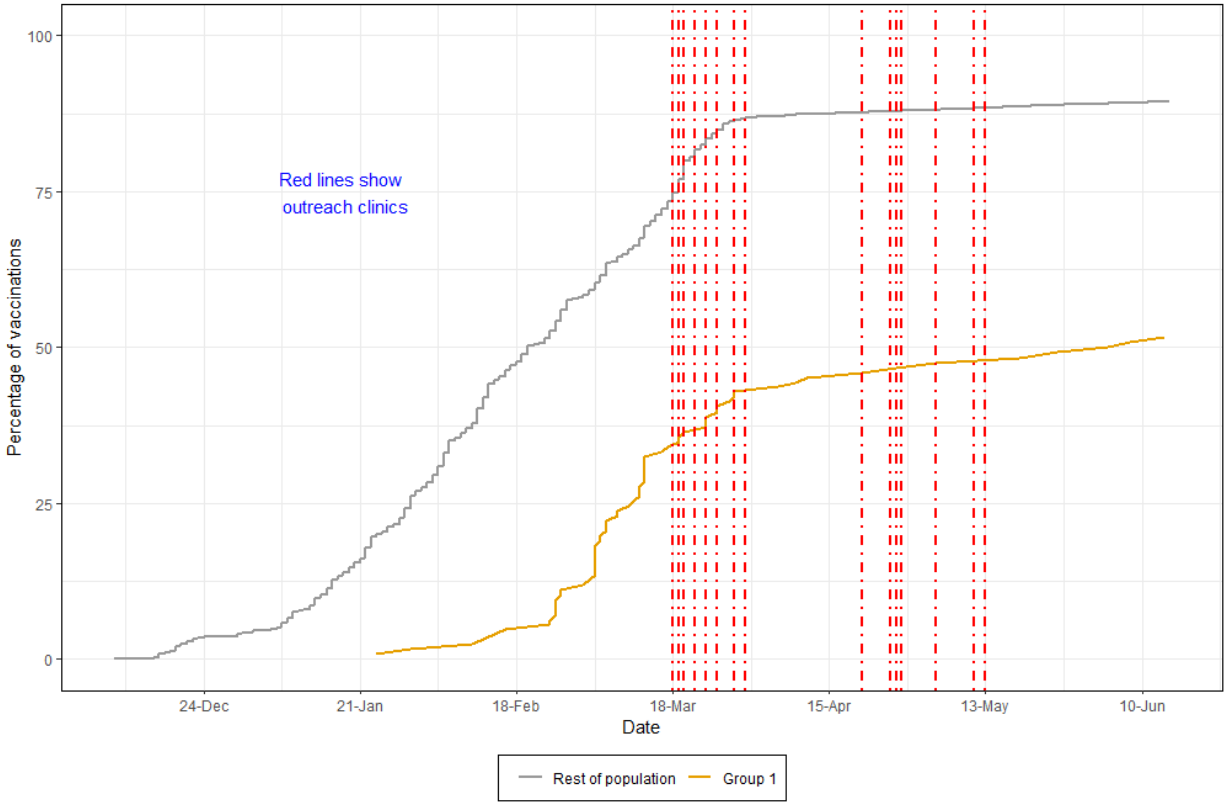
- Homeless huddle – weekly meeting healthcare, local authority, commissioners and providers of support
- Homeless Health Group – existing network of partners
- Partners included: CCG commissioners, Homeless Health services, Sirona care & health, Bristol City Council commissioners, St Mungos for rough sleepers

Outreach and engagement activities included:

- Outreach clinics delivered by Sirona care & health with support staff onsite:
  - Regular clinic at Homeless Health
  - Onsite clinics at hostels, hotels and other accommodation
- On street engagement – workers with trusted relationships with clients
- Learning from surge testing e.g., at Logos.
- Engaging homeless support workers, including in registering clients with GPs
- Keeping vaccination a persistent offer

Only 199 people are identified as homeless in the BNSSG SWD. Of this group, 47.3% of people have been vaccinated (to 17th May 2021, cohorts 1 to 9), compared to 84.4% of the whole population.

Figure 6. Percentage of COVID-19 vaccinations (first vaccines) for homeless people compared to the remainder of the BNSSG population (JCVI cohorts 1-9)



Box 3 gives the facilitators and barriers identified in working with homeless populations to maximise uptake from programme worker interviews. Note that many of these issues are across other groups that also experience severe social disadvantage.

Box 3. Facilitators and barriers to successful working to increase vaccination uptake in homeless populations – interviews with programme workers

Facilitators to increasing vaccination uptake:

Opportunistic, flexible approaches

- Combining vaccinating with surge testing
- Vaccinating off-cohort

Adapting to the client group

- Taking everything to them – many will not go to a vaccine clinic, and you need to be out on the streets or going to their accommodation and working with them
- Vaccination was a persistent, flexible offer for when it worked for them, with regular clinics available
- Incentives – food at vaccine outreach clinics

Using established networks and trusted people

- Staff engagement in homeless/support settings
- Homeless huddle with good working relationships between commissioned and non-commissioned support services and commissioners

Working around practical issues

- Change in accommodation pattern from dormitory hostels to isolated accommodation
- Vaccine storage requirements to avoid taking out individual vials
- Access to pinnacle to check patient vaccination status
- Issues with NHS number and NHS app use
- Having weekly team meetings so programme workers could share, reflect and adapt or problem solve as needed

Barriers to increasing vaccination uptake:

Homelessness is often not visible in the healthcare or wider system:

- "homeless" is often used to define those rough sleeping rather than all those on the housing support register.
- Coding of homelessness is often poor in health datasets.
- Many homeless people not registered with GPs
- The Housing support register and Abritas databases (local authority) to identify people who are homeless, but this may include limited medical data – and only where relevant to accommodation support need and priority.
- People may not have ID (issues for NHS app)
- People may have reasons for wanting to remain invisible e.g. No recourse to public funding, asylum seeking etc

Multiple barriers in accessibility or acceptability of vaccination for this population:

- Large number of people have experienced trauma and have an understandable mistrust in authority and statutory services
- Language barriers – especially no recourse to public funding
- Complex needs mean engagement takes time and trust, and a persistent offer from services

Lack of clarity over eligibility: staff and clients:

- Staff in the homeless sector can fall between cracks of social care and healthcare
- Staff initially needed a certain code to be registered
- Initially had to advocate for client clinical vulnerability

Practical barriers:

- Many dispersed temporary housing settings (due to C19 and lockdown changes) – so model of an outreach clinic in a homeless shelter doesn't work

Priority Group 2: Non-English speaking, ethnic minorities, asylum seekers and refugees

"I saw my community suffering, and I thought, I need to do something "
Programme Process Interview

Community co-production

In 2020 people from priority communities with knowledge of the local issues, were already advocating for action on COVID-19, and other health issues, e.g., diabetes screening. They were also engaging with leaders to protect people in their communities, e.g., working with mosque leaders to address issues like funeral requirements and COVID-19 risk. Following a BNSSG flu planning meeting, the PCN Lead for Bristol Inner City, the CCG, Sirona care & health and healthcare workers with community links developed pop up flu clinics in Southmead and Easton in Dec/Jan 21. They didn't attract large numbers but identified some of the issues stopping people getting vaccinated, and brought together partners from primary care, secondary care, local authority, LMC and the Mosque. This showed it was practically possible to build relationships and networks, coinciding with planning the COVID-19 vaccination campaign.

There is an overarching group 2 strategy, but individual groups or areas are managed by those with expertise/relevant responsibilities and links. Many of the engagement interventions (described in Table 4, page 17) were identified and produced by members of ethnic minority communities. Other ways the maximising uptake programme and healthcare workers with community links worked with communities are shown in Box 4.

Box 4. Ways the programme and communities worked together

- Sustained community focus groups and informal conversations led by trusted healthcare colleagues, to encourage uptake
- Enabled local leaders and influencers from the communities (Community Champions) to manage a simple booking system
- Co-designed with Community Champions and hosted several COVID vaccine "pop up" clinics in community centres, local mosques and gurdwaras with the capacity to vaccinate up to 250 people per session
- Co-designed with Community Champions, information in multiple languages in different media (text message, leaflets, videos, posters)
- Used council personnel to plan sessions and manage traffic, security at clinics
- Used Link workers who spoke different languages to support people arriving to the clinics
- Set up rooms to enable women to be vaccinated in a private area for specific clinics
- Used a wellbeing, safety and quality team briefing approach developed in North Bristol NHS Trust called Start Well End Well
- Encouraged those attending for vaccination to tell their friends and family using their social media channels and conversations
- Encouraged local TV coverage from popular ethnic minority channels
- Did a post-vaccination feedback survey in multiple languages to make future clinics better
- Created SOPs and Checklists and iterated them according to the Jamboard feedback from community vaccine clinic leads and surveys from attendees

Key structures and partners specific to group 2 include:

- COVID-19 Pandemic Bristol Board (Local authority-led with multiple stakeholders)
- Bristol Independent Advisory Group,
- Established community groups – e.g., Dawoodi Bohras
- Communities (leaders, healthcare workers, businesses and networks)
- PCNs in specific areas e.g., Bristol Inner City
- Sirona care & health
- Local authority community development/public health/elected members

Local networks developed from the flu vaccine clinic and other work in pandemic response; they include local people, businesses (e.g., supermarkets), faith leaders, GPs and other healthcare workers from the area. Professional community link workers built on existing community links e.g., foodbanks links to local authority community leads. The maximising uptake team and the PCNs began to get contacted by communities proactively. The programme worked to recognise the leaders and influencers specific to each community; this included faith leaders, elders in travellers community, business owners.

Outcomes

There are 126,710 people in group 2; 61.3% vaccinated (to 17th May 2021, cohorts 1 to 9), compared to 84.4% of the whole population. The relative gap between the general BNSSG population and uptake in small areas with the highest proportions of non-English language/ethnic minority groups widens from January to February and then narrows as shown in Figure 7. This coincides with outreach (and engagement) activity as shown in Figure 8. There is, however, still a gap in uptake requiring further work, and variation in uptake patterns between sub-groups as shown in Figure 10, page 29.

Figure 7. Uptake of COVID-19 vaccination for small areas (LSOAs) of BNSSG with higher proportions of people with non-English first language or from ethnic minority groups (referred to as BAME in this figure), for JCVI cohorts 1-5

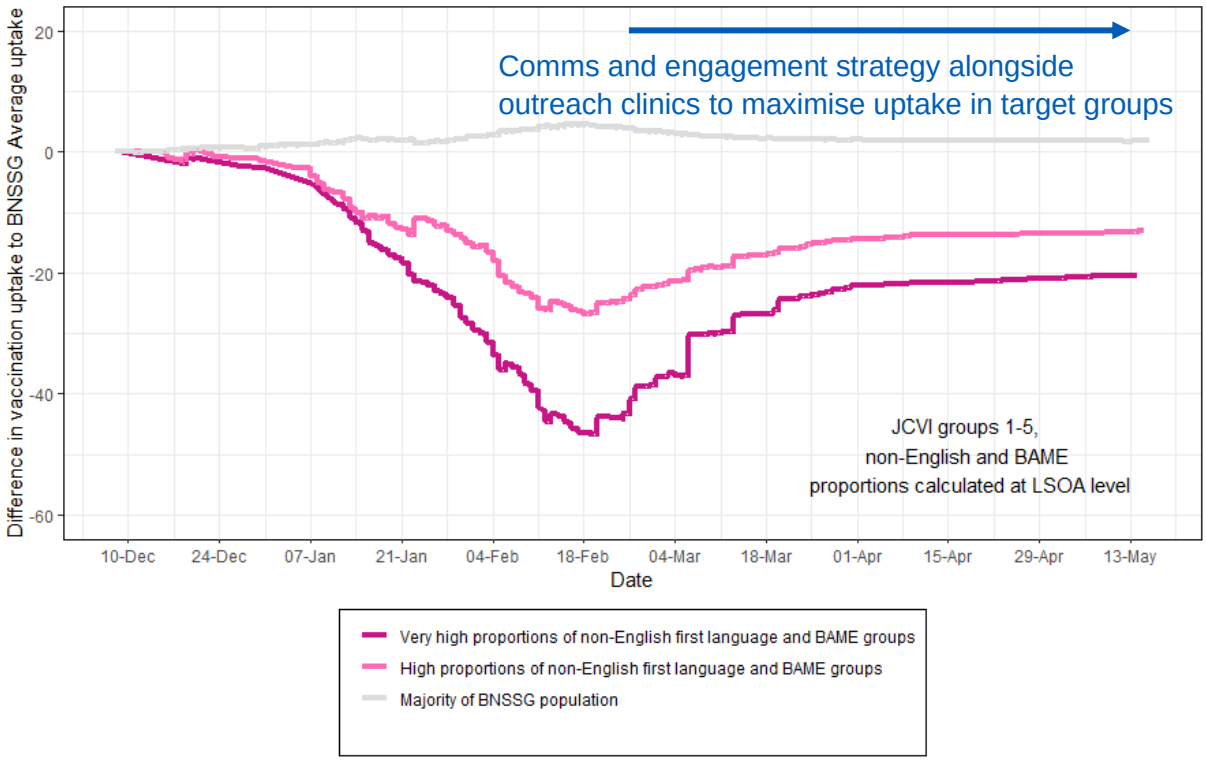
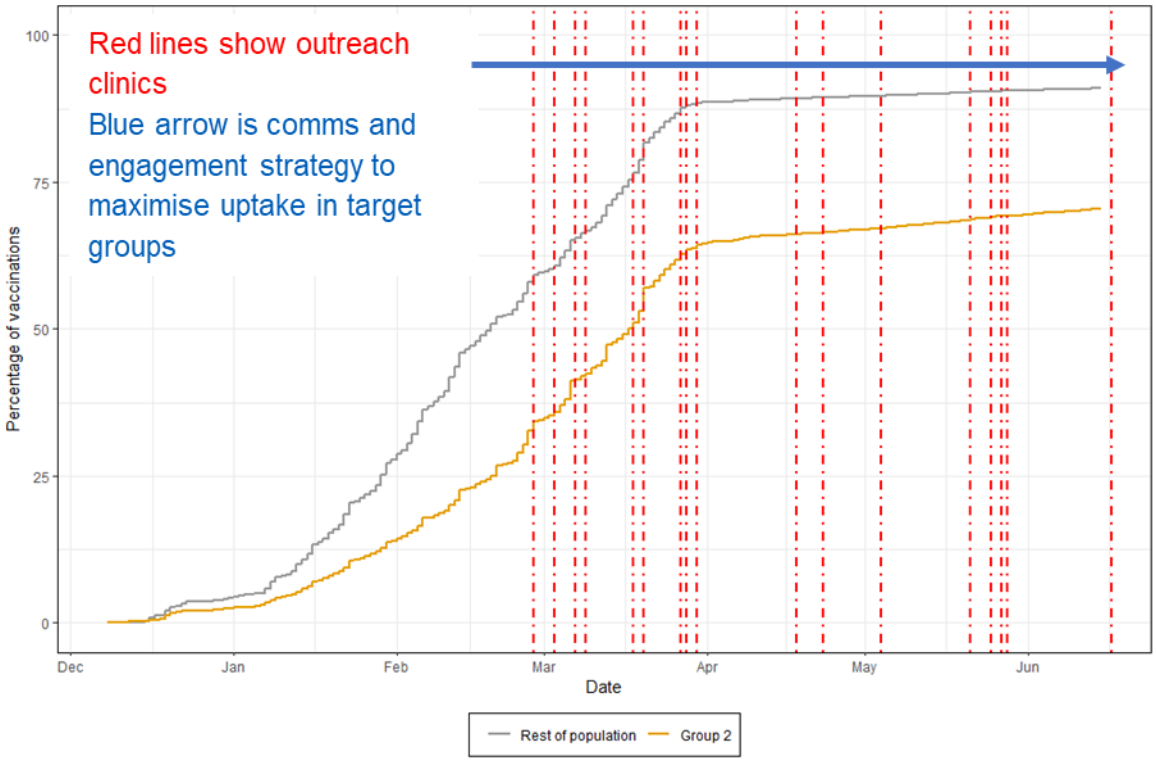


Figure 8. Percentage of population vaccinated (first doses) for group 2 vs the rest of the BNSSG population (JCVI cohorts 1-9), alongside outreach activities.

*Identified by fields “prim_language” and “ethnicity” in the system wide dataset attributes table, and supplemented by field “EthnicCategory” in NHS Digital hospital data. Data on asylum seekers and refuges not recorded in system wide dataset. The ethnic description of “British or mixed British - ethnic category 2001 census” is classed as “White” in this analysis.



There are sub-groups within priority group 2 where uptake has improved, and others where less progress has been observed. As Figure 10 shows, uptake rates failed to improve in the Eastern European population. As shown below, there is also a wider gap in uptake in younger people in priority group 2. For most language groups, a gap remains in uptake.

Figure 9. Percentage of COVID-19 first vaccinations for people in group 2 compared to the remainder of the BNSSG population (JCVI groups 1-9).

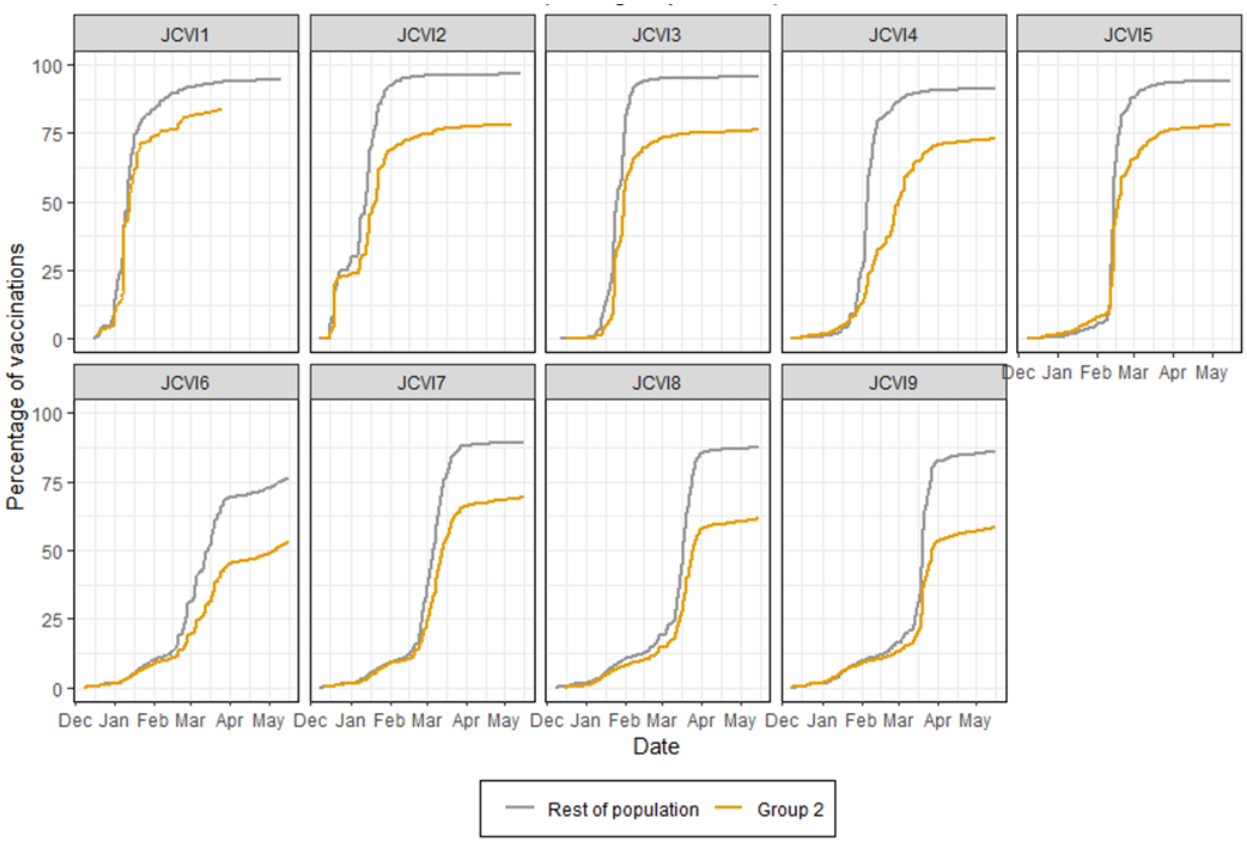
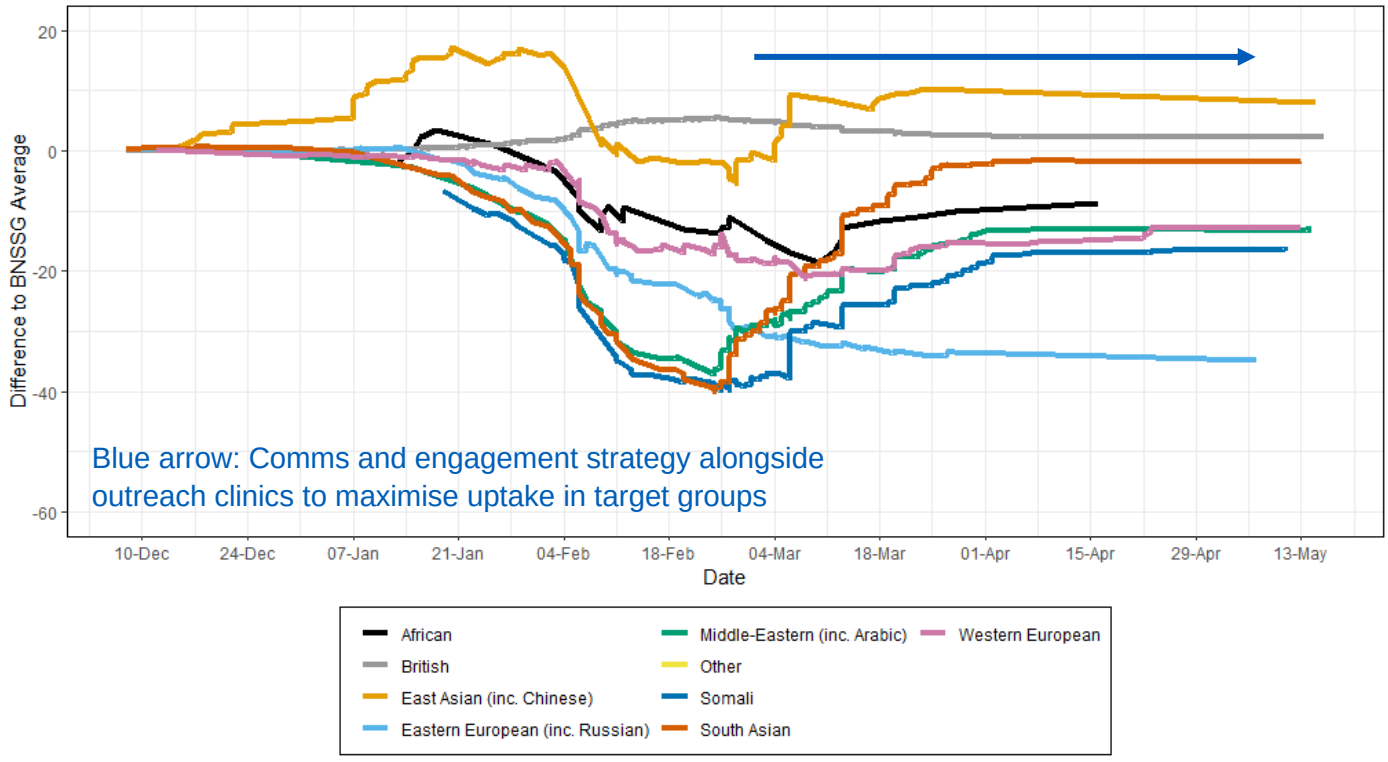


Figure 10. Uptake in non-English language groups compared to BNSSG average uptake of first dose COVID-19 vaccinations (JCVI groups 1-5).



The work in this area of the programme has used the co-production model with communities, and often ownership has been given to communities for the engagement and outreach work. This has been instrumental to the successful vaccination clinics run for these groups. There are however many historical and current barriers to overcome for the healthcare service to successfully engage with, and deliver effective care, to these communities. Please see Boxes 5 and 6 for a full description of the facilitators and barriers identified in this programme to working effectively with minority communities to increase vaccination rates.

Box 5-6. Process learning in maximising uptake with minority communities – interviews with programme workers and members of minority communities to identify facilitators and barriers

Box 5. Facilitators to working with minority communities to increase vaccination uptake:

- **Committed and passionate individuals**
  - People from communities or with community links have worked tirelessly as advocators, action planners, influencers, vaccinators etc
  - People have worked across organisational boundaries and collaborated for the cause, they have used years of experience and their established relationships and networks
- **Co-production with communities, and empowering them to work for themselves with NHS technical skills to support them**
  - Community leadership and action with community ownership: Mosque clinics: giving them clinics with their own booking system on paper, with inclusion/exclusion criteria, and CCG support as needed for questions and concerns. Working around issues like lack of Wi-Fi
  - Forums like COVID-19 pandemic Bristol Board flattened the hierarchy and communication chain between grass roots community groups and those with political power and influence
  - Using pre-existing networks of communities and professionals, and having community members within the vaccination programme
  - Talking to people in the community to learn what the issues were, including investing time at clinics and engagement events through Insight team
- **Learning and adapting**
  - Flu pilot scheme in Dec/Jan: uptake wasn't high, but lessons learned in barriers to vaccination and relationships built between community and professional partners
  - Learning by doing, and including surveys at clinics in the delivery plan to adapt to insights/needs
- **Communicating honestly, bilaterally and in relevant ways**
  - People delivering the messages who had constituency with that community: e.g., religious leaders doing webinars
  - Using relevant channels with: BCFM radio, DUNYA, videos on Healthier Together website, Somali Facebook groups, and others chosen by the community
  - Sharing programme updates with communities as partners
  - Being accessible e.g., phone number available for conversations about vaccine concerns
  - Adapting the messaging style away from traditional healthcare messaging, e.g., healthcare worker talks about personal fears around the vaccine
- **Digital ways of working**
  - Meetings on teams and zoom to be accessible to people who couldn't travel or were based in communities
  - Webinars: what is fact, what is fiction and what is opinion? The recordings were shared through twitter, and community networks
  - WhatsApp conversation groups for community leaders to network
  - Encouraging people to share their vaccination experience e.g., vaccine selfies on social media
- **Fitting the approach to the community needs**
  - Flexible appointments so people can come for the vaccine when they can/need
  - Understanding that information and influence flows through networks of family and friends, as well as through community leaders
  - Outreach: taking healthcare to the community, vaccinating out of cohort at outreach clinics, Sirona care & health HealthLinks workers
  - People with trusted relationships with communities doing outreach: trusted community workers going to traveller sites to vaccinate, familiar GPs at outreach clinics

Box 6. Barriers to working effectively with minority communities to increase vaccination uptake:

- **We need to acknowledge and address the root causes of low vaccine uptake**
  - How well do BNSSG partners serve minority populations and how do they integrate into communities?
  - Do we work with communities or try to do things for them?
  - Do we always consider inequalities in our workplaces, communities and when planning services?
  - Do we consider the legacy of issues these groups have experienced, and how this impacts on engagement with healthcare services? Strong sentiments of mistrust in the system for some individuals and communities. Although some have been empowered by the work, others are suspicious of the sudden interest in their community
  - Do we have enough diversity in the BNSSG workforce to allow engagement with these issues?
  - For some people in BNSSG, they have multiple layers of barriers e.g., asylum seekers
- **Communications can sometimes contain confusing messages or use the wrong format to maximise engagement with the message**
  - Some media and organisational messages about low uptake in certain groups: a "we're not quite sure why" message is unhelpful. It avoids acknowledgement of historical and current issues faced by these groups, and misses opportunities to highlight the root causes
  - Webinars suit some people, but are very professional and if information comes from healthcare professionals who haven't earned trust from the community then it can be met with mistrust or be in a form that's not useful for the community
  - Early posters and communications did not represent ethnic minorities well, so people couldn't engage with them. Additionally, people often don't read the language they speak. We now have videos in the right languages
  - Potentially some early missed opportunities to build trust and confidence with communities e.g., around burial procedures
  - Social media can be a powerful source of misinformation
- **National factors**
  - Vaccine availability vs windows of engagement with communities: sometimes communities have moved faster than vaccine availability
  - The pressure on primary care with progress through the cohorts, particularly for PCNs with younger populations e.g., Bristol Inner City
  - Situation in other countries – anti-vaccination messages
- **Practical barriers**
  - Limited access to the bus for flexible mobile clinics
  - Digital poverty in communities
  - Location of large-scale vaccination centre relative to Bristol Inner City, with limited options closer, and a population with low car ownership/ability to travel
  - IT and staffing issues at smaller vaccination centres
  - Boating travellers move regularly, and you need to work across CCG/local authority/county boundaries
  - Limited resources e.g., one mobile bus, and other technical issues
- **Process of engagement needs to be tailored to minority groups, and we've had less success with some groups:**
  - Consider the route in: Eastern European communities: Church faith leaders were less ready to engage in general. Some anti-vaccs messaging from these sources Tried shops, but not actually owned by members of community. Lacked capacity to engage with different cafes. Now mapping out workplaces and approaching community from that angle
  - Some communities don't have leaders e.g., new age travellers
  - Some groups will have reasons to want to stay unregistered or invisible to the system, so accepting that and not requiring e.g., GP registration is important

Asylum seekers and refugees

Work to maximise vaccination uptake for this sub-group was co-ordinated by a lead GP from The Haven, the Sirona care & health specialist primary care service for asylum seekers and refugees. This involved working with the voluntary sector (7 different charitable organisations supported this work) to deliver vaccines through outreach and Sirona care & health HealthLinks workers.

Successfully delivering maximising uptake work for this group included:

- Pop up clinic model – high turnout for this patient group, organised rapidly and opportunistically
- Involvement of voluntary sector in booking patients into clinics (combining texts and phone calls) and supporting clinics
- Using telephone translators at pop up clinics
- Sirona care & health lead GP and HealthLinks workers with good knowledge of this population and links to supporting partners
- Attempting to combine vaccination with registering people with a GP, and build engagement with healthcare, particularly for undocumented migrants

The true number of asylum seekers, refugees and undocumented migrants is unknown, but as shown in Table 6, a total of 235 first doses, and 23 second doses were delivered to these vulnerable populations up to end May 2021. Process learning results for barriers are shown in Box 7. This population are often poorly engaged with healthcare or remain unregistered. For these reasons, recalling for, and giving second doses is a particular challenge (see low numbers of second doses to date shown in Table 6, page 20).

Box 7. Process learning in maximising uptake with asylum seekers and refugees – interviews with programme workers

Barriers and challenges for maximising uptake with asylum seekers and refugees

- **Lack of capacity** to arrange vaccinations at the specialist GP surgery – although would this be an efficient model?
- **Undocumented migrants** who are usually not known to services and unregistered: 40+ came for a first dose. How do we support these people in their other healthcare needs, including second doses?
- Reliance on **committed individuals** to support this population – unable to register any attendees with other GPs due to lack ID/correct forms etc. **Mainstream healthcare** needs to work around these patients' needs and personal situations
- **Logistically co-ordinating clinics** from within Sirona care & health, but employing people from partner organisations
- Patients **may not be coded as asylum seekers/refugees** with regular GP practices, so they may be unaware of additional vulnerability and support needs in delivering vaccine
- People attending for vaccination may give **different names/dates of birth** – how do we ensure safe practice (e.g., 2nd dose) when they are unregistered with a GP, only on Pinnacle (vaccination data system) and with different details?
- **2nd doses within schedule** for people who require intensive input to engage with healthcare

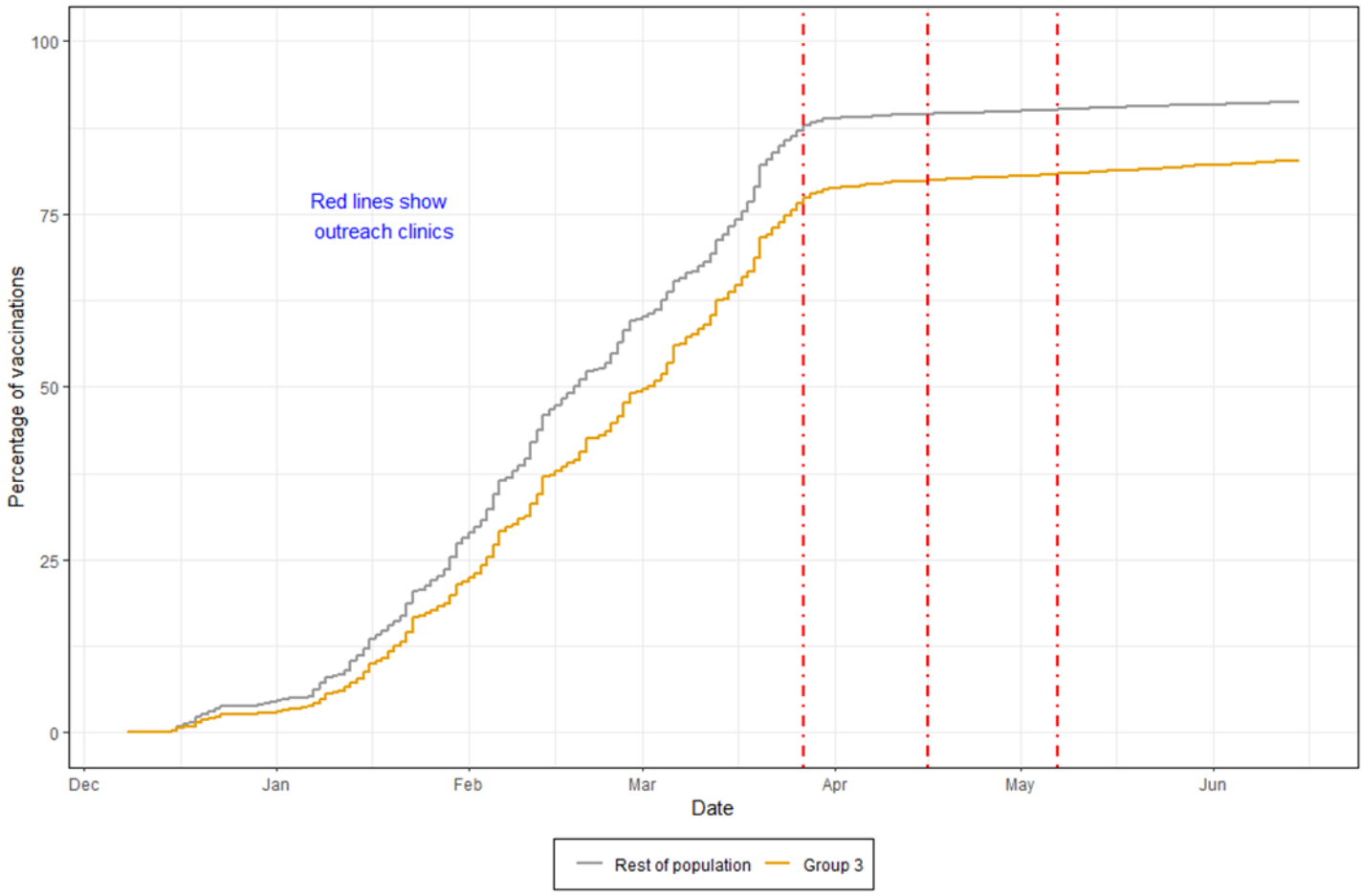
Priority Group 3: Those living a distance from the vaccine centre / in areas of high deprivation / rural communities / Gypsy Roma Traveller population

There are 226,148 people in group 3. After reviewing initial uptake data, the focus in the maximising uptake work was on those living in areas of high deprivation and Gypsy Roma Traveller populations. There was cross-over with group 2 in terms of people within the priority groups and engagement or outreach interventions, particularly for the deprived populations. Insight learning that fed into this strategy included interviews with members of the Boating community carried out by a neighbouring CCG. These revealed the importance of trusted known health and care professionals, adapting written material and outreach[11].

For the whole group, 76.8% had received first doses (to 17th May 2021, cohorts 1 to 9), compared to 84.4% of the whole population. There is a gap between priority group 3 and BNSSG average, with priority group 3 uptake trends mirroring wider uptake trends. This gap is smaller than for priority groups 1 or 2, but is consistently seen over time as shown in Figure 11.

Figure 11. Uptake of COVID-19 first vaccinations for people in Priority Group 3 compared to the rest of the BNSSG population (JCVI groups 1-9)

**Identified by field "wd_road_distance_to_a_gp_surgery_indicator" >= 5.5km in the system wide dataset attributes table, or IMD quintile of patient LSOA = 1. NB data on Gypsy Roma population not recorded in system wide dataset*



Elements of the strategy for the Gypsy Roma Traveller (GRT) Group included:

- Involvement of Sirona care & health professionals with good understanding of communities of interest that are not geographically placed, and of the differences between these groups
- Taking vaccines promptly to GRT sites at times that work for them
- Having established relationships with GRT from previous work
- Recognising elders as influencers in their communities and families
- Including council GRT liaison workers in outreach activities to provide marshalling, practical support, signposting people to vaccinators
- Communicating in relevant ways: e.g., using the term "needles" not "vaccines", incorporating literacy limits
- Making vaccination part of a wider approach to build trust and improve health outcomes for these groups: e.g., combining vaccination with MECC for other health and social issues

Outcomes for this subgroup are shown in Table 6 (page 20). From March – May 2021 78 first and second dose vaccinations were delivered by Sirona care & health outreach professionals to this group. Barriers to effective working are summarised in Box 8. In common with other marginalised groups, true numbers of these mobile or sometimes unregistered populations are not readily available.

Box 8. Process learning in maximising uptake with Gypsy Roma Traveller populations – interviews with programme workers

Barriers and challenges for maximising uptake with Gypsy Roma Traveller populations

- **Boating travellers** required to move regularly and may move across geographical boundaries e.g., into Bath, Swindon and Wiltshire area
- Some vaccine **concerns are very strongly held** in some groups (e.g., fertility in Irish travellers) and can be difficult to make progress, this relates to wider mistrust of the government/healthcare system
- **Less likely to have community leaders in some traveller groups** e.g., new age travellers
- Some groups don't want to be on the radar – allowing them to stay off the radar, not registering with GP etc to have vaccine is important
- Engagement with vaccination can change very quickly

Priority Group 5: Those who may struggle to access via a vaccination centre; learning disabilities, severe mental illness, physical disabilities, Drug and Alcohol Dependence, people with physical and sensory impairment, people with dementia

There are 111,898 people in group 5. The work for this priority group was co-ordinated by a lead GP for the GP collaborative board, with Sirona care & health leading on areas such as the Learning Disability (LD) service. Other partners included: PCNs and GP practices, Avon and Wiltshire Mental Health Partnership NHS Trust (AWP), Drug and Alcohol Services, alongside the partners listed in the main programme report.

The processes of working with these groups were different to the other priority groups, and are described below:

1. **Identifying sub-groups where uptake was an issue**:

- Developed a list of potential patient-level characteristics that could be barriers to access
- Extracted lists of patients from GP registers and shared data with the CCG who looked at vaccine uptake,
- Programme leads used results to identify if adaptations were needed.
    - Sensory impairment better than average uptake, however the uptake rates were lower for other sub-groups.
    - Profiled uptake within sub-groups to understand e.g., younger people with learning disabilities were falling behind

2. **Adapting mainstream vaccination programme**:

These sub-groups are not co-ordinated geographically linked communities with established networks as some of the other priority groups are. The strategy was therefore to tailor mainstream

approaches. Most vaccines were delivered by GP practices/PCNs and the large-scale vaccination sites, but supported by Sirona care & health and the Maximising Uptake Group. Work included:

- Writing a search for practices to identify patients e.g., with SMI using Quality and Outcomes Framework (QOF) definition and adding in Eating Disorders due to clinical vulnerability
- Working with large scale vaccination centres, Sirona care & health and PCN sites to incorporate adaptions for this group – e.g., learning disability needs for appointment time, quiet setting and limited waiting.
- Communicating with primary care via regular meetings and bulletins

3. Outreach work:

- Outreach clinics were generally not as useful for this group, although there is overlap with some outreach services due to a concentration of factors that reduce vaccination uptake in inner city areas.
- Housebound vaccines: Sirona care & health used EMIS to identify patients not able to attend a vaccination centre. They checked vaccination status with GP practices, and agreed the best approach. This included Sirona care & health going out to vaccinate people.
- Working with other care providers e.g., Avon and Wiltshire Mental Health Partnership NHS Trust to link vaccination to usual care and key workers for people with SMI.

Interventions by the **Sirona care & health Learning Disability service** for this group were:

  - Advice and guidance to enable people to access vaccination via their GP.
  - Accessible resources and awareness raising within the population.
  - Reasonable adjustment clinics at the large-scale vaccination clinic.
  - Community pathway for those not able to attend their GP or the large-scale vaccination centre. This pathway is for those with the most complex needs (e.g., needle phobia, behaviour that challenges etc). This work is still ongoing.

Outcomes

89.8% received first dose vaccines (to 17th May 2021, cohorts 1 to 9), compared to 84.4% of the whole population. As a priority group, the uptake is overall high, and has been through the vaccination programme (see Figure 12). However, the data for different sub-groups shows that some do have lower uptake, as shown in Table 7.

Figure 12. Percentage of COVID-19 first dose vaccinations for people in group 5 compared to the rest of the BNSSG population (JCVI groups 1-9).

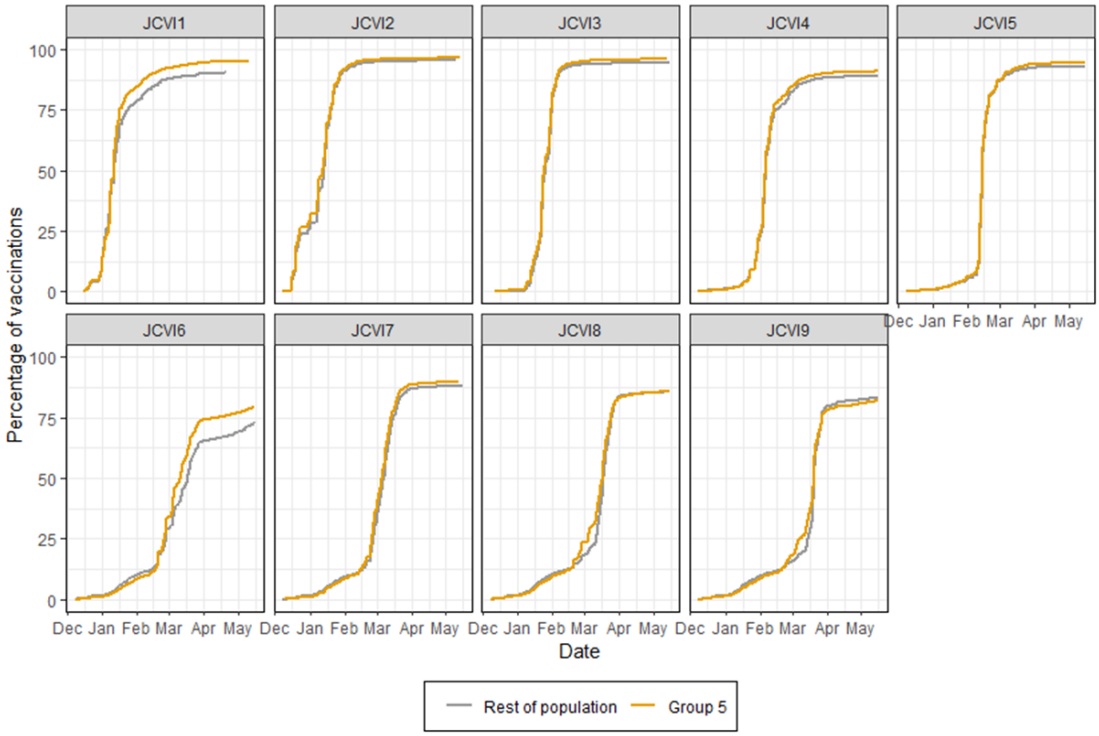


Table 7. Uptake rates in Priority Group 5 sub-groups JCVI cohorts 1-9, to 17th May 2021.

**Learning disability identified by fields "learning_dis", "qof_learningdis" in the system wide dataset attributes table, physical disability identified by fields "phys_disability", "cc_hemiplehia", "amputations" in the system wide dataset attributes table, physical and sensory impairment identified by fields "visual_impair", "hearing_impair", "macular_degen" in the system wide dataset attributes table, severe mental illness identified by field "qof_mental" in the system wide dataset attributes table, drug and alcohol dependence identified by "dep_alcohol", "dep_opioid", "dep_cocaine", "dep_cannabis", "dep_benzo", "dep_other" in the system wide dataset attributes table. NB SWD indicates a person has ever had a problem, not necessarily currently*

Priority Sub-Group	Number in the sub-group	Vaccination uptake (to 17th May 2021)	Relevant factors identified to explain uptake
Learning* disabilities	5,244 people	87.6% (above BNSSG average)	Involvement of carers Predominantly physical access issues – keen to be vaccinated Housebound visits Already well engaged with community support services (including GP)
Physical disabilities*	7,093 people	90.3% (above BNSSG average)	
Physical and sensory impairment*	79,072 people	92.3% (above BNSSG average)	
Severe Mental Illness*	8,991 people	80.7% (below BNSSG average)	Non-responsive to multiple services or healthcare offers Competing priorities vs vaccination
Drug and Alcohol Dependence*	13,336 people	76.5% (below BNSSG average)	

Uptake graphs for the subgroups of severe mental illness and drug and alcohol dependence are shown in Figures 13-15, alongside the process learning of the barriers to maximising uptake for these groups. Table 7 shows the factors identified in the process interviews that explain the successes and challenges with increasing uptake for these groups, and Box 9 gives barriers and challenges identified in the process learning interviews for this group. Notably, although uptake is good for people with learning disabilities, again there is variation within that group, and uptake is lower for younger cohorts with learning disabilities.

Figure 13. Percentage of COVID-19 first dose vaccinations for people with Serious Mental Illness compared to the rest of the population (JCVI groups 1-9)

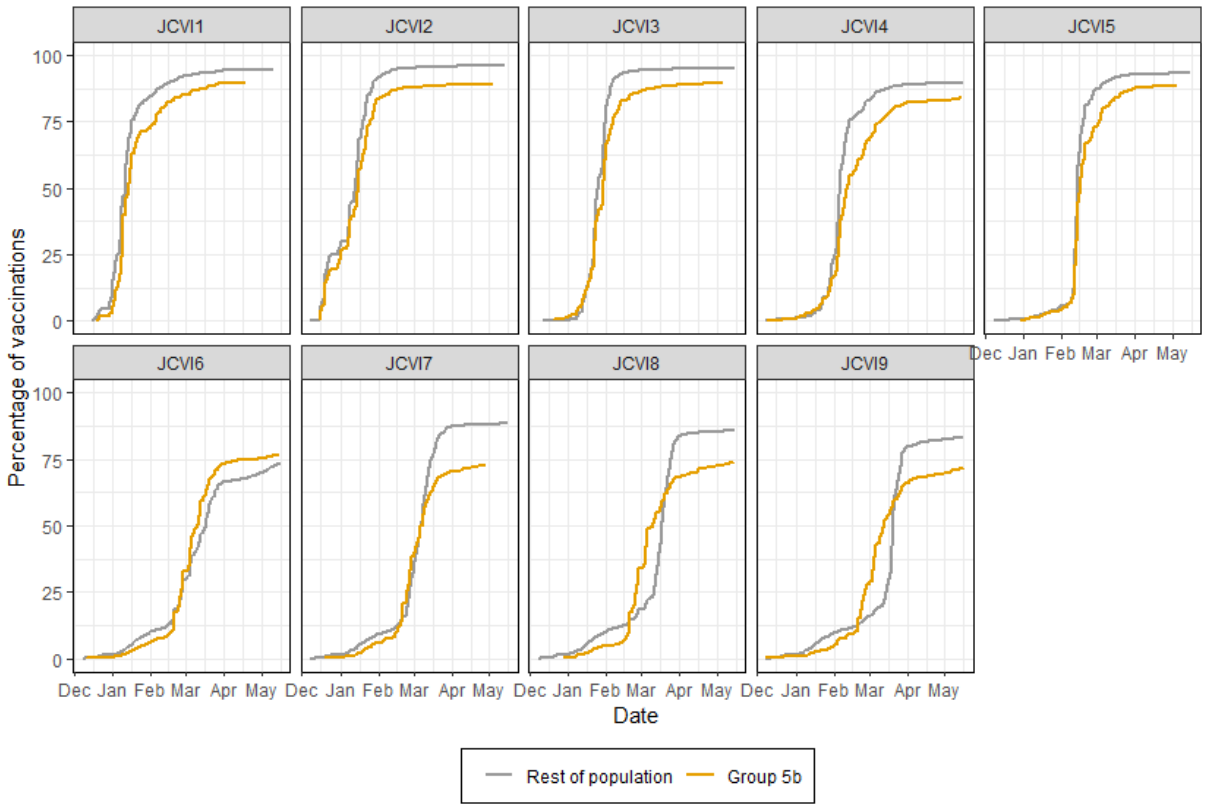


Figure 14. Percentage of COVID-19 first dose vaccinations for people with drug and alcohol issues compared to the rest of the population (JCVI groups 1-9)

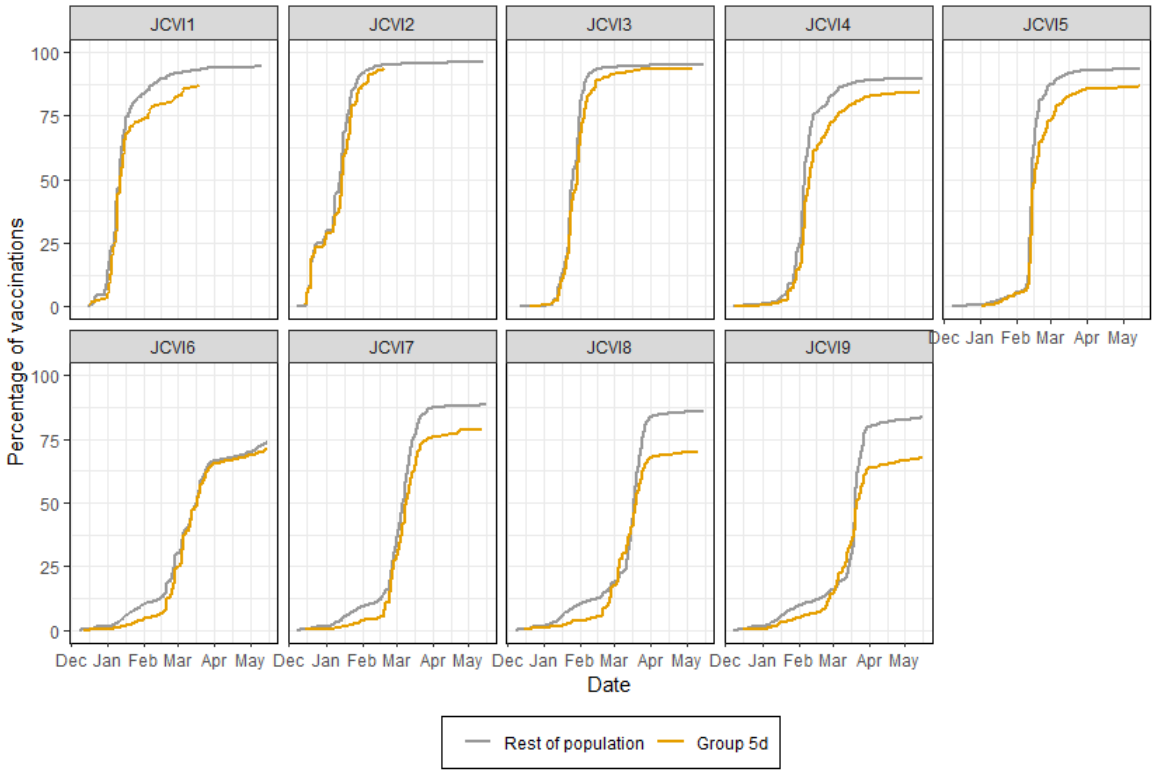
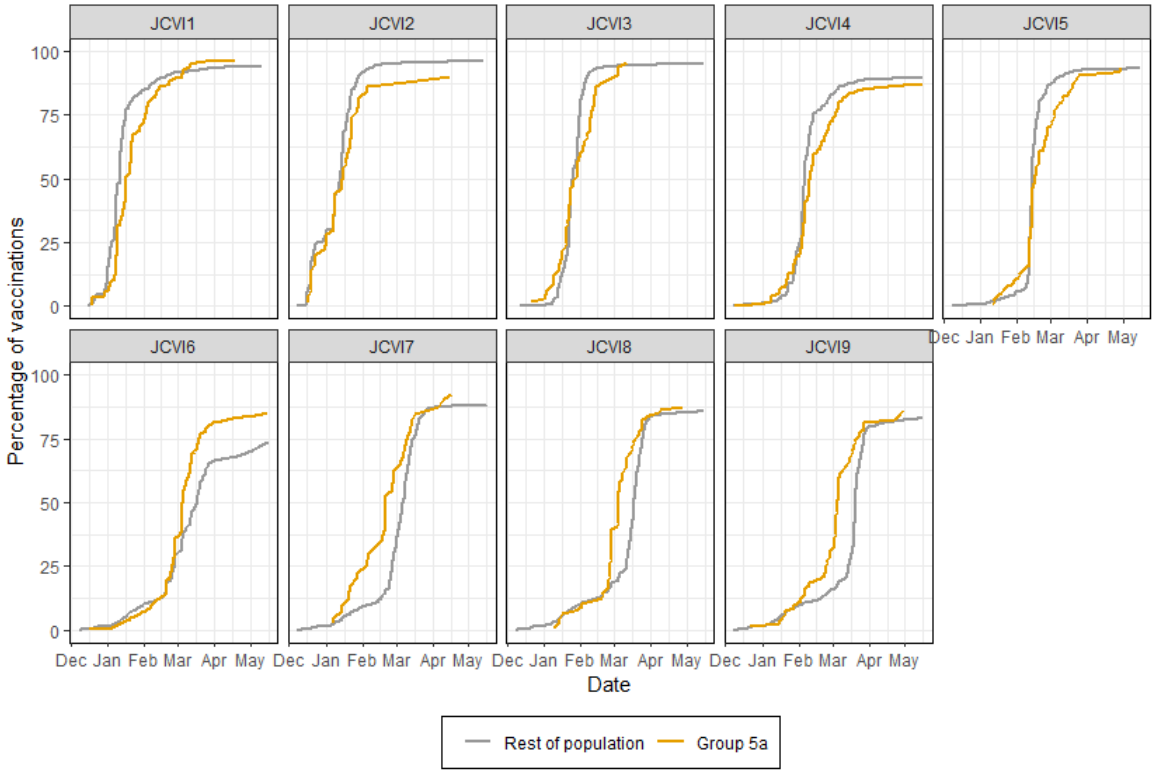


Figure 15. Percentage of COVID-19 first dose vaccinations for people with Learning Disabilities (LD) compared to the rest of the population (JCVI groups 1-9)



Box 9. Process learning for priority group 5 – barriers and challenges from interviews with programme workers.

Barriers and challenges to maximising uptake in priority group 5

- Not a coherent community with networks, but a group of people with a shared characteristic
- More likely to live inner city, but generally geographically dispersed
- May be non-responsive to multiple services or healthcare offers – requiring opportunistic, persistent vaccine offer which was difficult to deliver e.g., in Drug and Alcohol services where appointments and supply needed to be planned
- Multiple competing priorities vs vaccination for some of these patients
- Workload for partners (PCNs and Sirona care & health as schools re-opened)
- System used relies on people being identifiable through GP records or community support services
  -mild LD may be under-recorded, and less likely to have carer/service involvement
  -people with complex needs (Drug and Alcohol, Homelessness, Mental health) may not be visible on the system, and looking at overall uptake numbers will not identify uptake issues for smaller numbers of individuals with multiple barriers and vulnerability factors, where more intensive input/inclusion health work is needed.

Findings and Discussion

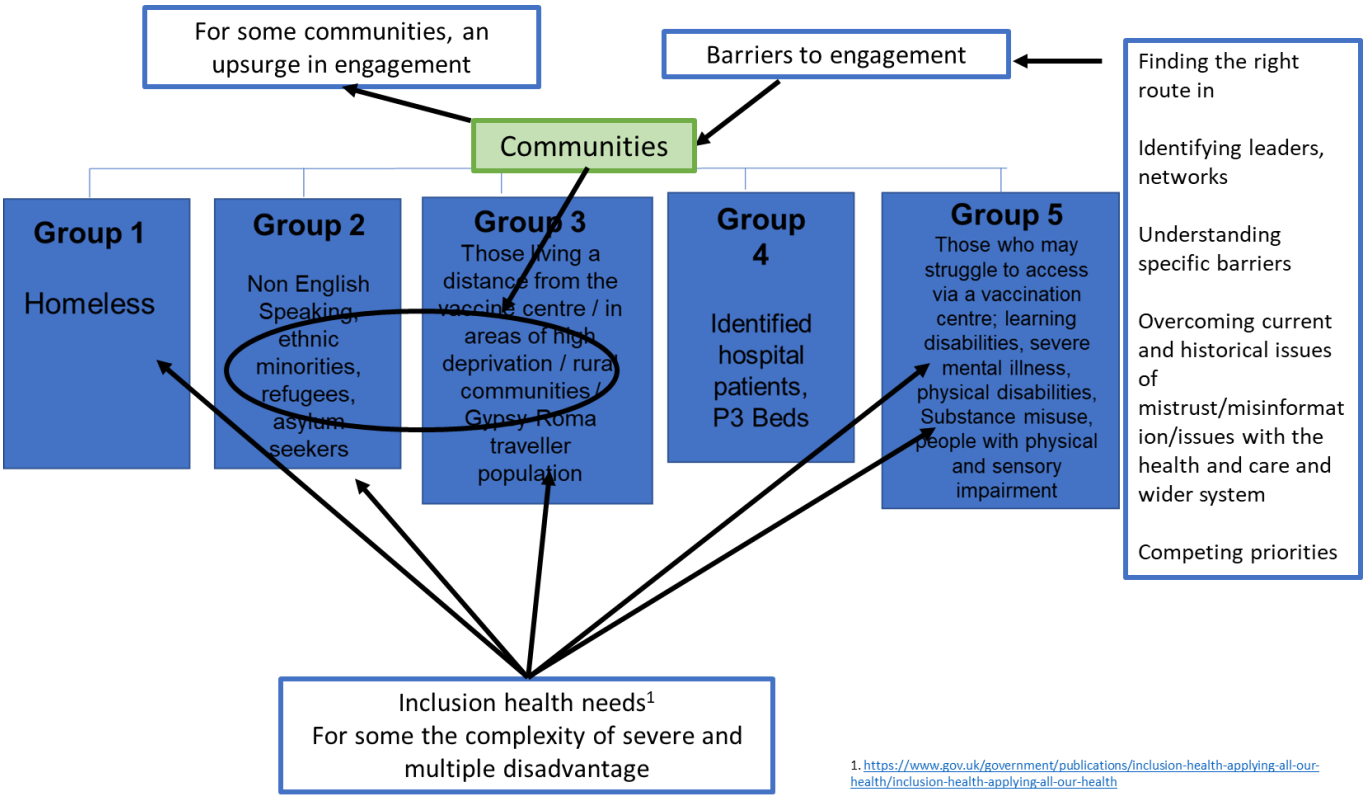
By end May 2021, the maximising uptake programme had used outreach work to deliver 2,558 vaccines. Use of population health data and insight work means these people are those most likely to catch COVID-19 and develop severe disease, and less likely to be vaccinated. Although this is the minority of vaccines delivered in this period, this is a significant result.

The process learning shows it is working within the maximising uptake programme structure to combine the four programme elements that have delivered this:

- population health management (using data)
- insight work
- communication and engagement
- outreach

The programme structure has allowed leadership, and task and finish groups to take ownership of different areas of the programme. It provides a structure for strategizing, reporting, partnership working and sharing expertise. It needs to be recognised that sometimes the divisions are arbitrary, as demonstrated in Figure 16.

Figure 16. The priority group structure and barriers to engagement



The overall impact of the whole programme is difficult to quantify. For some priority groups uptake rates have moved towards BNSSG averages, coinciding with maximising uptake work. This is not however proof that the maximising uptake programme drove the uptake, and this is also not the case for all priority sub-groups. For those groups where a narrowing of the gap with whole population BNSSG uptake rates has been seen, there is still a gap, and work to be done considering the barriers shown in Figure 16. The process learning identifies a need to continually review routes of engagement for different subgroups, and to refine or change the communication and outreach model.

The evidence shows that influence around vaccination spreads through community networks, and therefore an unknown quantity of people will have been vaccinated because of the engagement work, or indirectly through the wider influence of outreach activities. Some of the priority groups have very poor health outcomes, and may not be engaged with, or well-served by mainstream healthcare. Vaccination has been used as an opportunity to identify and act on other health issues. In addition, the wider benefits of building engagement and trust with these individuals, groups or communities must be factored in.

The qualitative process learning from those within the programme identified many factors that have driven success, as well as challenges. There was felt to be real value in the programme. Positive outcomes and processes related to working with ethnic minority communities, and passionate committed individuals from those communities came through strongly in the process interviews.

Cost-effectiveness is difficult to assess in this context. It must be acknowledged that an unknown proportion of people vaccinated in outreach settings would have been vaccinated later in the main

programme; however, in the early outreach clinics 15.5% had already been offered vaccination in another setting and had not taken that offer up. Further, 67% of survey respondents at one community clinic did not want a vaccine with their GP or at the large-scale vaccination centre[8]. Vaccination significantly reduces the risk of hospital admission (88% + for first dose after 4 weeks[12]), and there is a good evidence-base for which populations are less likely to be vaccinated, so **additional costs of £15 per dose is likely cost-effective in high-risk cohorts.** This is because it effectively prevents many primary and secondary cases that lead to morbidity and mortality, involving admissions/other healthcare interactions/wider societal costs. For context, locally an average Intensive care unit stay is estimated at £1,283 per bed day[13].

Notably, this cost only considers vaccines given by the outreach team, and does not include people who were vaccinated by PCNs or large-scale vaccination centres because of engagement work or positive influences within their community from outreach. Costs to NHS per vaccine are therefore likely lower, especially considering the more recent outreach/walk in clinics with large uptake numbers. As discussed, ongoing programme costs are more difficult to estimate with changing models of delivery and unknown future need for maximising uptake in different populations.

The four programme elements described have worked together in this programme. Systems for learning and insight work from outreach/engagement, combined with regular population health data analyses likely increases the overall effectiveness (and cost-effectiveness) of the maximising uptake programme by:

- aiding prioritisation of target groups for outreach
- improving communication to influence uptake at outreach clinics and within wider system
- improving outreach strategies and delivery methods so that more doses can be given per activity (and likely reducing vaccine wastage)

For these reasons continual review of the engagement and outreach strategies is needed.

Themes for adaptation of the programme and sustainability themes (from the process interviews and this evaluation) are shown in Box 10.

Box 10. Themes for adaptation and sustainability from process interviews with programme workers and community members

How can we engage with people or groups where methods so far haven't worked?

- Do we need further insight work?
- Are we drawing on best practice from around the UK?
- What are the routes into certain groups - are we working with employers effectively?
- Continue to adapt the model: walk in clinics vs pop up clinics vs workplace vaccinations
- Can we tie outbreak-control into messaging about future vaccination?

We must continue to consider resources and prioritisation of maximising uptake work

- Iterative use of population data alongside insight work
- The balance between outreach and supporting people to access mainstream healthcare
- Many have volunteered their time and expertise. Is this sustainable? How do we reward and recognise people?
- Support for PCNs, especially where resources needed per patient to vaccinate are higher
- Avoid competition between large scale vaccination centres and PCNs

Keep the processes and commitments that have driven success

- The strategic steer through the vaccination programme partnership board,
- The oversight/governance and operational problem solving provided by regular CDG meetings, feeding out to the MUG and task and finish/delivery groups.
- Working with communities using a co-production model where the healthcare system gives them power to make decisions and come up with solutions
- Flattened hierarchies between communities and healthcare leaders have facilitated a proactive, agile response
- Continue to develop the partnership working across the BNSSG system

Continue to use population data in ways to understand need, prioritise, and test

- Continue to use data iteratively to guide and refine the maximising uptake approach
- Be proactive towards information governance and data sharing needs going forwards
- Consider data sharing agreements between partners e.g., PCNs/practices with vaccine non-responders and MUG vaccine coaches
- Focus on communication within the system between the national booking system and PCNs e.g., PCNs need to see who already has an appointment
- Look at primary care recognition and coding of priority characteristics

Anticipate issues

- Anything that happens so rapidly is prone to lack of resilience – how do we build this in?
- For instance, consider potential booster campaigns next winter with additional pressures GPs are likely to be under
- NHS app – this requires knowledge of NHS number or proof of ID, which won't work for some patient/population groups
- As we move towards younger cohorts are the patterns of uptake going to remain the same across the priority groups?

Consider wider health and social care issues for different patient/population groups:

- Use the vaccination programme as a chance to make the contact count, and vice versa
- Continue to build a BNSSG system focus on health inequalities and community engagement

Many of the priority group populations experience health inequalities - poorer health outcomes than the average population. Reducing health inequalities is a priority for the BNSSG system[14]. Inclusion health is a 'catch-all' term used to describe people who are socially excluded, typically experience multiple overlapping risk factors for poor health (such as poverty, violence and complex trauma), experience stigma and discrimination, and are not consistently accounted for in electronic records (such as healthcare databases)[15]. Some people prioritised in this programme will fall into this group, and the maximising uptake work presents opportunities to build on these ways of working, and meet inclusion health needs to reduce health inequalities.

Caveats of the evaluation

This is a rapid evaluation. It has worked with available evidence and learning needs within the programme. As such, it is a pragmatic evaluation[16], and there are limits to conclusions around causality, or cost-effectiveness that can be drawn. It is part of a wider evaluation programme, and further quantitative work is underway to build on the evidence base in this respect. It also describes a programme developed in unique circumstances. This means lessons have been drawn and recommendations made for adaptation or transferability, but the process of review and refinement will continue to be needed.

Conclusion and recommendations

This programme has worked in new ways necessitated and facilitated by the global pandemic and national emergency. Phase 3 (booster) vaccines are approaching, alongside the 2021/22 influenza vaccination campaign. This evaluation identifies learning from the first phases of the mass vaccination and maximising uptake programme that can be used to inform our approach to this next phase. As a system, this is also an opportunity to build on these approaches to reduce health inequalities and engage with groups that have experienced inequities or are not well-served by traditional models of healthcare. The recommendations given below are intended to give focus on adaptability and transferability to those working in the vaccination programme, and across the BNSSG system.

Summary recommendations

Recommendations for the maximising uptake vaccination programme:

1. **Maximising uptake must remain a priority.** To allow cost-effective interventions, we need to **continue to re-evaluate our maximising uptake strategy and processes** with iterative use of Population Health Management tools (data) and insight work on:

- Resources
- Prioritisation of priority sub-groups
- Methods of engaging with people or groups where we've had less success so far
- Support for partners including PCNs

2. We must anticipate potential issues in the programme:

- **Potential lack of resilience** in a rapidly developed programme reliant on committed individuals
- **Rising workload** around other health and care issues
- **Combination of influenza and COVID-19 vaccines** – changing delivery models and uptake factors

Recommendations for the wider BNSSG system:

3. Continue to strive for equity of health outcomes for the BNSSG population, using and developing on effective ways of working within the maximising uptake programme

- **Co-production with communities** – giving them ownership to develop engagement and deliver outreach
- **Working across the BNSSG integrated care system with providers**, combining strategic oversight with professionals with in-depth knowledge, experience and trusted relationships with underserved groups
- Providing **governance** that supports flexible, innovative, rapid ways of working
- Investing in **insight work, communications expertise and use of population health management data tools**

4. Continue to develop the BNSSG approach to reducing health inequalities, considering wider health and social care issues for different patient/population groups, and how we develop "inclusion health"

Recommendations are also given for the different priority groups, where these are specific to the needs of that group

Homelessness recommendations (COVID-19 vaccinations and beyond)

Note many of these are also applicable to other groups who experience severe forms of social disadvantage and poor health outcomes

1. This population experience extremely poor health outcomes. **Striving for equal outcomes** should guide the approach; so investing resources e.g., in vaccinating homeless people has potentially large returns.

2. We need to work on **coding and data sharing:**
    - As a system, how do we identify people who are homeless, what does that term mean in healthcare, and who has access to data in systems like Pinnacle – the software used to record COVID vaccinations?
    - There are wider data sharing needs and opportunities. The housing support register is accessible for council-workers and is currently very separate to any healthcare datasets
    - This is not a static population and people move between categories of homelessness, we need to understand that and adapt our ways of working

- Requirements such as: NHS number, phone number, address, proof of ID are barriers to engagement

3. **Homeless support staff** are a valuable resource as trusted sources of information and support, with pre-existing relationships with clients that take time. However, staff are also potential sources of infection, and may have concerns about vaccination themselves. Options include:
    - Vaccination strategies in partnership with providers for their staff and clients.
    - Training to address gaps in skills and knowledge
    - They need to be prioritised for preventative interventions, including vaccinations

4. Engagement and Delivery methods: we must plan for **intensive support and flexibility**
    - Appointments don't work for everyone. This group needs persistent engagement offers which can be resource-intensive, including repeated contact on the streets, opportunistic offers e.g., at Drug and Alcohol support services, and taking interventions to them (mobile vaccination unit)
    - Must include trusted support staff
    - Consider small incentives e.g., food
    - Written materials can only be used alongside personal engagement, and need to be simple English – some can't read, others have language barriers
    - People should be able to self-identify or self-present to homeless healthcare interventions, as well as seeking out known-homeless clients

Recommendations for working with minority communities (COVID-19 vaccinations and beyond)

General recommendations

1. Consider COVID-19 alongside other health and care issues for these groups, with **acknowledgement of the historical and current issues** these groups face in engaging with healthcare
    - use the opportunity to highlight other health inequalities and needs, as well as combine interventions or engagement
    - as a system aim to develop and formalise the community co-production model, giving communities ownership for health interventions and strategies. This could include training community link workers, bringing communities into partnership agreements, including community members in strategic and operational forums

2. Continue to **strive for diversity and inclusivity** (including community participation) in senior forums and workforces

3. Continue to **develop a BNSSG health and social care communication approach** that is relevant, accessible and builds trust with communities

Vaccination programme recommendations:

1. Consider **sustainability and resources**:

- we have relied heavily on committed individual healthcare workers. Can we move towards more resilient models: e.g., recruiting clinical leads for community engagement?
- there are competing priorities, especially for communities coming out of lockdown. Consider how we reward and recognise community partners
- avoid over-promising to communities, this will undermine trust

2. We need to focus on sub-groups **where engagement/uptake has been less successful**:
    - Be mindful as a programme not to prioritise communities in ways that create different inequities or rifts. Continue to do outreach on a basis of need and equity
    - Barriers of access, culture and language were reduced by communication, workforce diversity, and an outreach model. Keep these principles but adapt the methods: e.g., vaccine coaches with language skills contacting non-responders, work with workplaces with high levels of Eastern European employees

Recommendations for priority group 5 and people who can be vaccinated in the mainstream system

1. GPs, PCNs, Sirona care & health and other services already engage with and support many people in priority group 5, and have been key to delivering vaccines. Bringing together different organisations and developing new **communication networks** has been beneficial and should continue. As a system we need to continue to work in ways that accommodate and **support workload, work force and wider priorities within these services**.

2. **Strategic leadership from primary care** brings understanding of the systems/workload/ways of working to increase impact of the maximising uptake work

3. Engagement and Delivery methods:
    - The maximising uptake team can support mainstream services to **identify individuals** in this priority group e.g., through importable searches
    - For groups such as those with learning disabilities, **adaptations to mainstream services** have been successfully made, and supported by the maximising uptake team

References

1. Munro, A., Boyce, T., & Marmot, M. (2020). Sustainable health equity: achieving a net-zero UK. The Lancet Planetary Health, 4(12), e551-e553. Available at; https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30270-9/fulltext
2. Bristol-wide webinar. (2021). COVID VACCINATION "MYTHBUSTING" WEBINAR. Available at; https://www.youtube.com/watch?v=MYHZdnxGwyI&t=1167s
3. ALAMA (2021). Covid-19 Medical Risk Assessment. Available at; https://alama.org.uk/covid-19-medical-risk-assessment/
4. Lewer, D., Braithwaite, I., Bullock, M., Eyre, M. T., White, P. J., Aldridge, R. W., ... & Hayward, A. C. (2020). COVID-19 among people experiencing homelessness in England: a modelling study. The Lancet Respiratory Medicine, 8(12), 1181-1191. Available from; https://www.sciencedirect.com/science/article/pii/S2213260020303969
5. Hayward, S. E., Deal, A., Cheng, C., Crawshaw, A., Orcutt, M., Vandrevala, T. F., ... & Hargreaves, S. (2021). Clinical outcomes and risk factors for COVID-19 among migrant populations in high-income countries: a systematic review. Journal of migration and health, 100041. Available at; https://www.sciencedirect.com/science/article/pii/S2666623521000088
6. MacDonald and the SAGE working group on Vaccine Hesitancy. (2015). Vaccine hesitancy: Definition, scope and determinants. Vaccine, 33(34), 4161-4164. Available from; https://www.sciencedirect.com/science/article/pii/S0264410X15005009?via%3Dihub
7. BNSSG CCG Insights & Engagement team. (2021). Outreach clinics COVID-19 Combined survey results. Summary report and overview – May 2021.
8. BNSSG CCG Insights & Engagement team. (2021). Easton Community Centre COVID-19 vaccination clinic survey results. Summary report and overview – March 2021.
9. Boobis, S. and Albanese, F. (2020) *The impact of COVID-19 on people facing homelessness and service provision across Great Britain.* London: Crisis. Available from; The impact of COVID-19 on people facing homelessness and service provision across Great Britain (2020) | Crisis | Together we will end homelessness
10. BNSSG CCG. (2020). Interviews with people who are homeless around COVD-19, vaccinations and the COVID-19 vaccination programme. Engagement Report and Implications.
11. Bath, North East Somerset, Swindon and Wiltshire. (2021). Insights gathered from the boating community around COVID-19 vaccinations Engagement report: January 2021.
12. Vasileiou, E., Simpson, C. R., Shi, T., Kerr, S., Agrawal, U., Akbari, A., ... & Sheikh, A. (2021). Interim findings from first-dose mass COVID-19 vaccination roll-out and COVID-19 hospital admissions in Scotland: a national prospective cohort study. The Lancet, 397(10285), 1646-1657. Available from; https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00677-2/fulltext
13. South West Region Critical Care Capacity and System Operation – Final Report. 2021.
14. BNSSG CCG. (2021). Health priorities for the local population. Available at; https://bnssgccg.nhs.uk/about-us/what-we-do/our-priorities/health-priorities-local-population/
15. Public Health England. (2021). Inclusion Health: applying All Our Health. Available from; www.gov.uk/government/publications/inclusion-health-applying-all-our-health/inclusion-health-applying-all-our-health#why-take-action-on-inclusion-health-in-your-professional-practice
16. Better Evaluation. (2016). Realist Evaluation. Available from; Realist Evaluation | Better Evaluation

Appendices

Appendix 1.

Structured interview guide for programme workers (adapted for community leaders)

Section 1: Learning from the programmes:

1. Please describe how the process of engagement was developed and identify any key people. You might consider –
    a. How was early insight work or data used?
    b. What was our relationship like with this community/group before the engagement work?
    c. Were there key community leaders or partner organisations involved?
    d. How did we learn as we went along?

2. Please describe what has worked well in engaging with, and increasing vaccination rates in one or more of the priority groups.

3. Please describe any barriers to successful engagement you have encountered – these might be practical, cultural, language, resources or otherwise. Have we managed to overcome these barriers?

4. Please describe how the maximising uptake programmes need to adapt moving forwards

5. How do the mass vaccination teams, the PCN teams and the maximising uptake teams work together to engage people and increase vaccination uptake?

6. Governance: is the governance process clear and straightforward? Does the relationship between programme management and those working directly with communities work well (and why)?

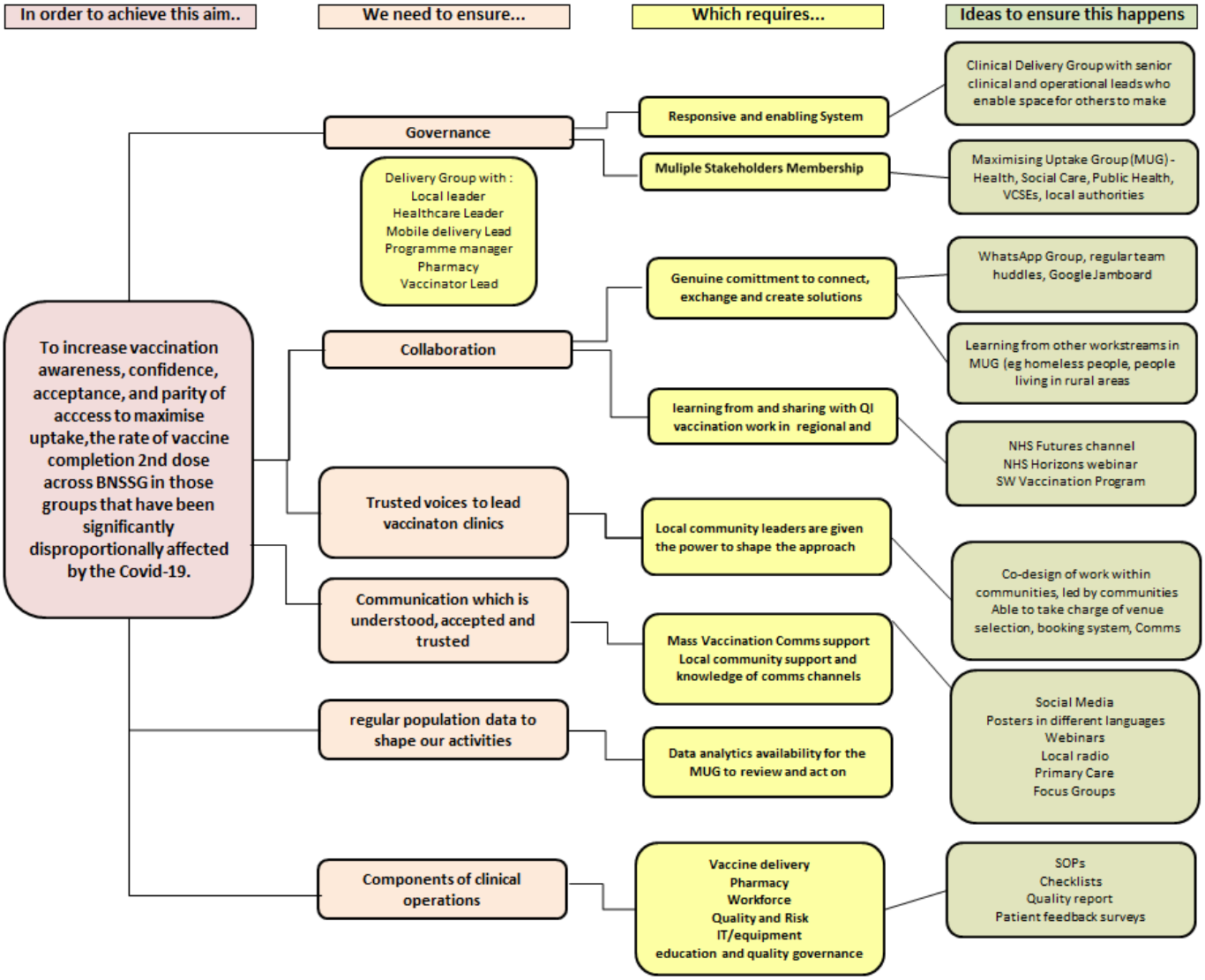
Section 2: About you:

7. What is your job title and role in the vaccination programme?

8. Do you work with, or have personal links to a particular priority group, that have been relevant to your work (please leave blank if you would rather not answer this)?

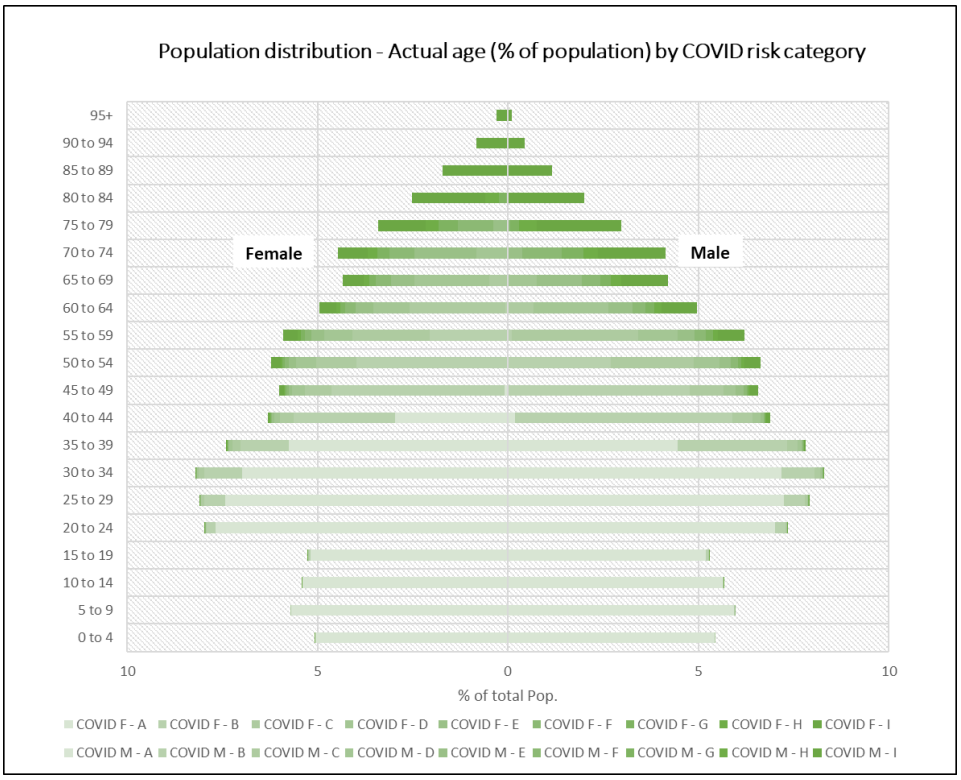
Appendix 2.

Driver diagram of programme aims, and steps required to achieve them

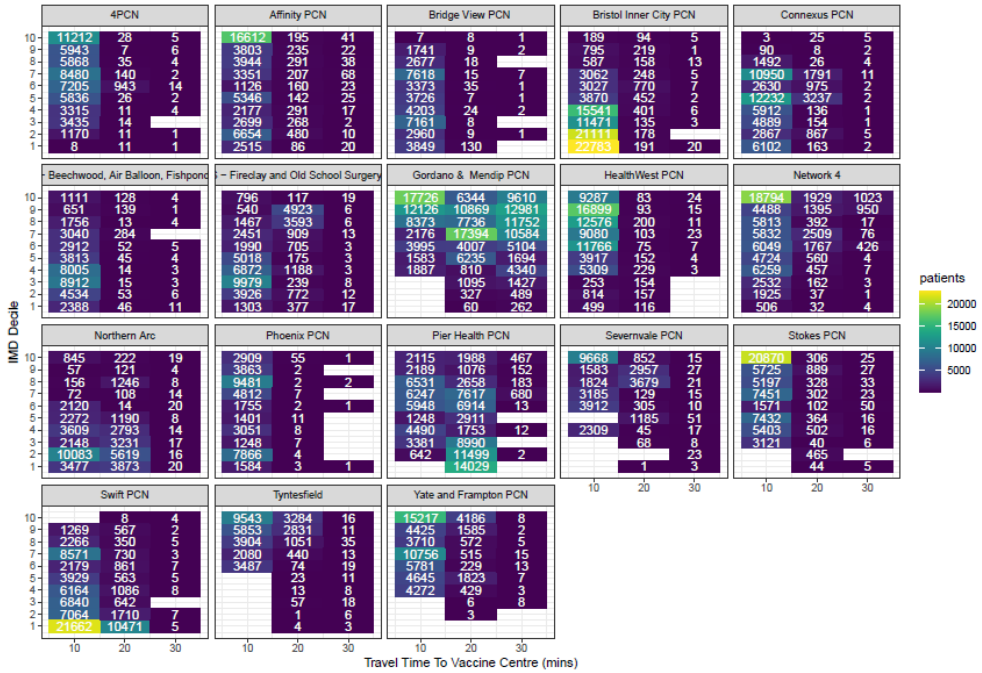


Appendix 3

ALAMA risk scoring for the BNSSG population



Calculating “COVID age” for individuals based on published risk factors, and assessing “vulnerability”: risk that someone will (a) get infected and (b) develop serious illness https://alama.org.uk/covid-19-medical-risk-assessment/

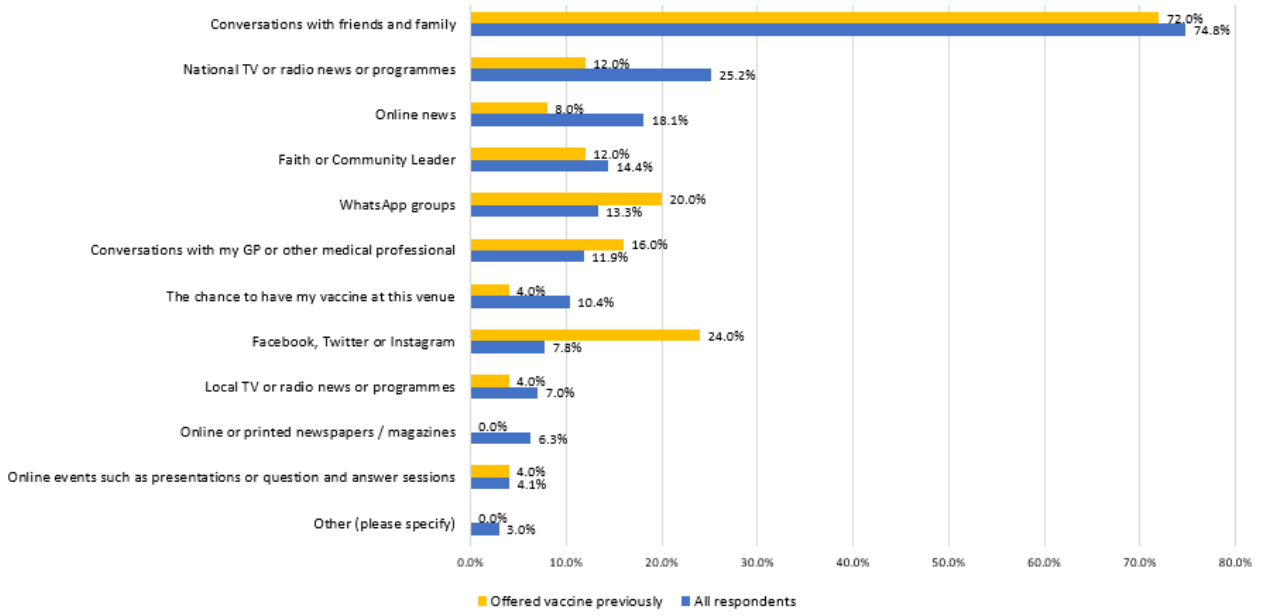


Travel time to vaccination centre by PCN and IMD decile in BNSSG.

Appendix 4

Results from a survey carried out at an outreach clinic.

What helped people decide to get vaccinated at the outreach vaccination centre?



Were attendees concerned about the vaccine prior to vaccination ?