

Using an Online Nominal Group Technique to Determine Key Implementation Factors for COVID-19 Vaccination Programmes in Community Pharmacies

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Abstract

Background: One vital strategy to fight the COVID-19 pandemic is the rapid roll-out of vaccination programmes. In a number of countries pharmacists are joining the vaccination programme workforce, including plans to involve community pharmacies in the process.

Objectives: (1) to determine key implementation factors for rapid roll-out of COVID-19 vaccination programmes in European community pharmacies and (2) to test an online approach of the nominal group technique (NGT) to generate ideas and reach consensus to achieve the first aim.

Setting: In February 2021, during a workshop at the 12th Working Conference of the Pharmaceutical Care Network Europe (PCNE).

Methods: An online nominal group technique workshop over 10 hours was conducted. Identified implementation factors were mapped to the Framework for the Implementation of Services in Pharmacy (FISpH) and assessed in terms of importance and changeability.

Main outcome measure: Consensus of key implementation factors.

Results: In total, 85 implementation factors were identified. The top 3 factors were the same for both criteria: (Regular) Staff training on correct vaccination procedure / to perform hands-on injection technique; Training in basic life support / first aid (Cardiopulmonary resuscitation), and; Definition of process, roles and responsibilities in the team.

Conclusion: An online NGT process enabled international collaboration in gathering diverse perspectives on the implementation of COVID-19 vaccination programmes in a time and cost-efficient manner. The process was effective in identifying implementation factors and finding solutions. Online NGT processes may be suitable for other implementation problems, not only during a pandemic.

Impact Of Findings On Practice Statements

- With appropriate training and support, community pharmacists can deliver critical health services to the public and communities they serve, including mass vaccinations in primary care.
- As the network of community pharmacies is already embedded within primary health care systems, this resource could be used for the rapid roll out of public health services, including mass vaccinations.
- NGT is a suitable method for generating ideas and consensus in a virtual format.

Introduction

SARS -CoV-2 (COVID-19) emerged in November 2019 and was declared a global health emergency and pandemic by the World Health Organization (WHO) in March 2020 [1, 2]. The virus has since spread

across parts of the world at an alarming rate and COVID-19 infections are causing significant morbidity and mortality. Many countries are experiencing second and third waves of COVID-19 [3]. Lockdown measures and mass vaccinations can help reduce viral transmission [3]. However, the impact of mass vaccination will depend on the speed and coverage of its roll-out [4].

Utilising existing primary health care, including pharmacists and community pharmacies, is one component of Government policies to expedite mass vaccination programmes [5, 6]. The involvement of trained pharmacy staff delivering vaccinations in community pharmacies has shown to have a positive impact on public vaccination coverage, for example increasing the reach of annual influenza vaccination programmes [7, 8]. One advantage of including community pharmacies in vaccination programmes is convenient access to the public due to their geographical spread [5, 6]. As such, engaging community pharmacies and pharmacists into the strategy to provide COVID-19 vaccinations has already been initiated or planned in some countries, including Canada, USA and some European (EU) countries including, Northern Ireland, Italy, Switzerland and the UK [9–20]. To ensure rapid roll-out of COVID-19 vaccination programmes across European community pharmacies, both in terms of widespread uptake by pharmacists and the population, consideration should be given to the implementation factors which may facilitate or hamper the endeavour.

Identifying potential implementation factors during programme development and prior to roll-out can assist the development of tailored implementation strategies, thus reducing the risk of poor uptake and subsequent low reach to the target population [21]. Implementation science bridges the gap between innovation development and evidence gathering (in this case COVID-19 vaccination programmes) and real-world practice [22, 23]. Mapping implementation factors to constructs in an established implementation framework allows better understanding of the different influences and how they may be addressed [24].

In February 2021, at the 12th Working Conference of the Pharmaceutical Care Network Europe (PCNE), a workshop was held to identify factors potentially influencing the implementation of COVID-19 vaccination programmes in EU community pharmacies. The workshop used an adapted online format of the nominal group technique (NGT). NGT is a highly structured consensus method that is widely used in health services research [25]. The technique offers participants the opportunity to discuss ideas freely and to voice their opinion without judgement [26].

This study had two aims (1) to determine key implementation factors for rapid roll-out of COVID-19 vaccination programmes in European community pharmacies and (2) to test an online approach of the nominal group technique. This study was exempt from Ethics approval under Swiss law (Req-2021-00147, 10.2.2021)

Methods

Participants

Participants signed-up for the NGT implementation workshop after registration for the PCNE-Working Conference and were assigned on a first come basis by the conference committee. The workshop group comprised 23 pharmacists from 11 countries, working in a range of settings, with varying levels of clinical, research and implementation expertise (Table 1). The workshop was facilitated by 3 experienced researchers (TFC, JCM, EP).

Online nominal group technique (NGT)

The NGT was used as an idea generation and consensus method. The NGT has several advantages including time efficiency, cost effectiveness and adaptability. Furthermore, NGT equally considers views of all participants, avoiding one individual dominating the group, and has demonstrated validity [27].

The original NGT consists of 4 steps, namely (1) Silent generation of ideas in writing, (2) Round-robin feedback from group members to record each idea (3) Discussion of each recorded idea for clarification and evaluation, (4) Individual voting on priority ideas [28].

The NGT has been adapted and expanded including for priority setting of evidence-practice gaps in implementation science [27]. Further adaption to the NGT occurred for this study. Due to the COVID-19 pandemic the conference, including the workshops, were conducted in an online format via Zoom® software. The workshop time frame was for 5 two-hour sessions (10 hours in total), over 3 days. Thus, the online format and time constraints required adaptations to the NGT method to make it more flexible and feasible online (Fig. 1).

At the opening workshop session (2 hours) the participants received an introduction to implementation science and practice. This introduction focused on the Generic Implementation Framework (GIF) and Framework for the Implementation of Services in pHarmacy (FISpH) [29, 30]. Background literature regarding COVID-19 vaccines and NGT and its adapted online format were also presented. Following the general introduction participants were purposively assigned based on their knowledge and experience with implementation science into 4 smaller groups, in accordance with a team-based learning approach [31]. At the end of the opening session a preliminary research question was presented, which was discussed and refined by the whole group. The final research question was: What are the factors required for the implementation of a rapid roll out of a COVID-19 vaccination strategy during a community pharmacy delivery phase in the EU? 3 assumptions were made: (1) vaccination in community pharmacies is legally allowed, (2) vaccine supply is ensured and (3) vaccine requires normal cool storage (2–8° Celsius).

The next 4 workshop sessions (8 hours in total) were used to conduct the steps of the NGT in an online format (Fig. 1). During the first step (“Generating implementation factors”), participants individually brainstormed the factors that may influence the implementation process of a COVID-19 vaccination program in community pharmacies in the EU. The aim of this step was to generate as many ideas as possible thinking across the phases of the implementation process.

The 2nd step (“Recording implementation factors”) included round robin feedback sessions within participants’ four smaller breakout groups to discuss and concisely record each factor. Each factor was recorded so that they were independent of each other without multiple clauses. Groups listed their implementation factors in a spreadsheet (MS Excel) for collation by the moderator. The moderator (EP) distilled statements into individual factors and removed duplicates.

The 3rd step of the online NGT (“Clarifying and distilling implementation factors”) involved the moderator and participants clarifying any factors for which they were unsure of the meaning or whether they constituted duplicates. A final version of the list was provided to all participants.

At the 4th step (“Individuals rate the importance and changeability of factors”) participants were asked to rate the relative importance and changeability of each factor of the compiled list using a Likert-type scale from 1 to 5, with 5 being the most important or changeable. This step was used to ensure that each participant had read and considered each implementation factor in detail prior to group discussion and consensus.

During step 5 of the online NGT (“Prioritisation of implementation factors”), each participant prioritised 5 implementation factors for the criteria “importance” and “changeability”.

Step 6 (“Rating group discussion”) began with discussions in smaller groups about each member’s individual prioritised implementation factors. Participants shared their ratings, speaking in turn to list their top 5 for each criterion (importance and changeability) and provide any clarification for their choices.

During step 7 (“Reaching group consensus”), the breakout groups re-convened as one large group to review and discuss the implementation factor ratings, resolve any differences and reach consensus about the five most important and most changeable implementation factors.

At the end of the workshop all participants provided verbal consent to receive an invitation by email to an online survey to collect data about demographics and professional experience. The survey contained items related to age, gender, professional experience, country of residence, prior expertise with NGT / implementation science and vaccination in community pharmacy. The survey was designed as a google form and a link was sent to all participants via email.

Post-conference data analysis:

The Framework for the Implementation of Services in pHarmacy (FISpH) was used to code the identified implementation factors [30]. The FISpH is based on pharmacy practice research and 2 other implementation frameworks adapted for pharmacy practice, namely the Consolidated Framework for Implementation Research (CFIR) and the Theoretical Domains Framework (TDF) [32, 33]. All identified implementation factors were mapped independently by 2 authors (DM and AI) whilst striving to avoid double-coding. These factors were considered within a European context, where in many countries

activities like training and marketing are provided at the system level. Any discrepancies in coding were resolved by thorough discussion. A 3rd coder (JCM) checked for consistency.

The final scoring results for each factor on importance and changeability given by the small groups were presented in Tables 3 and 4.

Demographic data of participants were presented using descriptive statistics (frequencies, mean, standard deviation, and range). Microsoft Office Excel 10 and Statistical Package for Social Sciences (SPSS) (SPSS v.20; SPSS Inc, Chicago, IL, USA) were used for data analysis.

Results

Study sample

23 participants signed up for the online workshop held at the 12th PCNE-Working Conference. Participants were from 11 different countries with expertise in pharmacy (research and/or clinical practice). All participants, except one filled in the online survey on participants' basic characteristics. The basic characteristics of 22 participants are presented in Table 1.

Table 1
Participants' demographics

	38.0 (9.6), 25–63
Professional experience, mean (SD), range years	11.6 (7.6), 1–30
Gender, n (%)	
Female	17 (77.3)
Male	5 (22.7)
Country of residence, n (%)	
Australia	1
Belgium	2
Denmark	2
Germany	4
Norway	1
Slovenia	1
Serbia	3
Switzerland	6
The Netherlands	1
United Kingdom	1
Professional expertise, n (%)	
Academia	13 (59.1)
Community pharmacy	3 (13.6)
Academia and Community pharmacy	3 (13.6)
Hospital pharmacy	2 (9.1)
Professional organisation (e.g. pharmacy chamber, national pharmacy board)	1 (4.5)
Prior experience with NGT, n (%)	
Used it before	2 (9.1)
Read about it	7 (31.8)
No experience	13 (59.1)
Familiarity with implementations methods and strategies, n (%)	

	38.0 (9.6), 25–63
Worked in this field	9 (40.9)
Read about it	8 (36.4)
Not familiar	5 (22.7)
Is vaccination in community pharmacies legal (in participants' country of residence)?, n (%)	
Yes	10 (45.5)
No	6 (27.3)
Currently under development	6 (27.3)
Have you ever been vaccinated in a community pharmacy? n (%)	
Yes	7 (31.8)
No	15 (68.2)
Have you ever vaccinated a patient?, n (%)	
Yes	3 (13.6)
No	19 (86.4)

Identified implementation factors

Individual brainstorming yielded 160 implementation factors. After removal of duplicates 85 implementation factors remained. These implementation factors were mapped to the FISpH as shown in Table 2 [30]. Implementation factors pertaining to the organisational/pharmacy level were most frequent (n = 32), followed by implementation factors relating to the wider external setting (n = 22), the local setting (n = 16), characteristics of individuals involved in the implementation of the service (n = 10) and finally factors relating to the intervention characteristics [the vaccination programme] (n = 5).

Table 2
Implementation factors

FISpH construct*	Implementation factors
Innovation (vaccination programme) factors	
Implementation complexity	Preparation of the single shots
Design quality & packaging	Supporting materials from manufacturers (leaflets)
	Provide information/leaflets to patients about possible ADR and instructions what/where to report
Nature of innovation	Vaccine prescription
	Staff reorganisation e.g. hiring more staff
External system	
Remuneration	Remuneration to set-up/prepare for service implementation
Healthcare budget & contracts	Remuneration for the service (by government, patients or other sources / third party payers)
Interprofessional networks & communication	Inter professional recognition (system level recognition and acceptance by other professionals)
Stakeholder buy-in	Support of the national pharmacy organisation(s)
	Acknowledgement of the pharmacists a health care provider from other healthcare providers who may also participate in vaccination
External support and / or assistance	Advertisement/ public announcements/ recommendation on vaccination in pharmacies
	Guidelines / SOPs from national pharmacy organisation
	Strategy in case of an emergency
	Clarification on insurance for staff
	Telephone helpline for patients (nationwide)
	Information on vaccination strategy (voucher/sheet/appointment card)
	Information on vaccination status / vaccination passport (access to online patient record / tool of health care system)
	(Regular) Staff training on correct patient risk assessment for vaccination
	Appointment system (online booking of vaccination time slots for citizens)
* FISpH Framework for the Implementation of Services in pPharmacy (Moullin 2016)	

FISpH construct*	Implementation factors
	<p>Administrative support to identify patients belonging to a certain priority group</p> <hr/> <p>Information and measures for a hygiene concept (guidelines)</p> <hr/> <p>(Regular) Staff training on correct vaccination procedure / to perform hands-on injection technique</p> <hr/> <p>(Regular) Staff training on correct monitoring procedures after vaccination</p> <hr/> <p>Training in vaccine centres prior to local pharmacy vaccination</p> <hr/> <p>Training in handling side effects</p> <hr/> <p>Training in basic life support / first aid (Cardiopulmonary resuscitation)</p> <hr/> <p>Material for vaccination (needles)</p>
Local Setting	
Intraprofessional network & communication	Collaboration on the task within smaller pharmacies
Interprofessional network & communication	<p>Availability to communicate with other healthcare (GPs) in situations where it is necessary</p> <hr/> <p>Referral from other health care professionals (local)</p> <hr/> <p>Support from other health care professionals</p>
Community's perception about innovation and organisation	<p>Clear arrangements in the community (clear direction in the community)</p> <hr/> <p>Patient awareness of the service</p> <hr/> <p>Patient acceptance for vaccination (local population beliefs)</p> <hr/> <p>Patients' trust for service in the pharmacy</p>
Relationship with patients and community	The pharmacy is easily accessible by the patient/ Community pharmacy location in terms of accessibility (physical location)
Demand	<p>Local demand</p> <hr/> <p>Active recruitment of patients</p>
Patient needs & resources	<p>Community pharmacist timings need to be accounted especially and should be accessible beyond school and office hours</p> <hr/> <p>Patients' satisfaction with the service</p> <hr/> <p>Relatively short waiting time (patient perspective of getting in CP)</p>

* FISpH Framework for the Implementation of Services in pPharmacy (Moullin 2016)

FISpH construct*	Implementation factors
Patient needs & resources/Organisational factor: Data management system	Documentation on vaccination / reminder for patient
Peer pressure	External pressure for broad provision of the vaccination
Organisation (pharmacy) Factors	
Structural characteristics	Waiting facilities need to be considered especially when administering to older people
Staff	Number of pharmacists and technicians (and enough skilled and trained staff)
	Staff, including technicians, nurses, pharmacists, students (medicine, pharmacy)
	Limited pharmacy workforce
Layout & workflow	Room/Space for vaccination (external flat/containers/office spaces/hotels)
	Community pharmacy infrastructure should support administering in private consultation room / appropriate space within the pharmacy to perform vaccination
	Availability of the waiting area/observation area/space (inside)
	Provision of social distancing measures (inside)
	Hygiene concept (general for the vaccination site; separation from infected people)
	Preparation area (laboratory)- workflow (inside)
	Waste removal
Teamwork	Definition of process, roles and responsibilities in the team
Readiness for implementation	Rearrange internal workflow (compatibility of intervention to existing systems)-
Leadership engagement	Head of pharmacy/ pharmacy manager acceptance
Available resources and training	Availability of internet / telephone / documentation to report the adverse drug reactions
	Long opening hours in pharmacies
	Software to register vaccination to link to national surveillance system
	Correct storage of vaccines at pharmacy (stock)
* FISpH Framework for the Implementation of Services in pHarmacy (Moullin 2016)	

FISpH construct*	Implementation factors
	Storage space and equipment (fridge), for open vial
	Material for hygiene / safety
	Material for emergencies
	(Lack of) Time
Access to knowledge and information	Availability of software / literature for drug-drug interactions
	FAQ sheet/database for pharmacy staff
Data management system	Access to central database to view and record patient and intervention data / availability of the medication patients records in order to review the health condition of the patients and history of previous illness (including COVID)
	Follow up of patients for second dose
Quality assurance system	Inclusion and exclusion criteria for vaccination (risk factors) (check list and priority lists)
	Collection of additional data (drug information) post marketing
Environmental stressors	Workload
Organisational support and assistance & Access to knowledge and information	Clear information at the pharmacy on when, how and why to be vaccinated
Organisational support and assistance	Social media
Experience	Previous community pharmacy experience with vaccination (i.e. flu)
Individual (pharmacist and other pharmacy staff) factors	
General knowledge	Knowledge about patient target group
Knowledge about the innovation	Pharmacy staff knowledge (pharmacists and technicians) education about immunization with different types of vaccines (indications, contraindications, adverse drug reactions)
Beliefs about the innovation	Concerns about adverse events by pharmacy staff
Technical skills (experience, capacity & competence)	Staff identifying eligible patients
	Expertise in recognized inclusion and exclusion criteria for vaccination (risk factors) /check list
* FISpH Framework for the Implementation of Services in pHarmacy (Moullin 2016)	

FISpH construct*	Implementation factors
Interpersonal skills (experience, capacity & competence)	Patient counselling about vaccination
	Community pharmacists' patient dealing skills (social skills) in order to help minimize vaccine / injection fear / reluctance
	Communications skills of pharmacists
Values & motivation	Staff acceptance / willingness
	Pharmacist motivation to contribute to control the Covid - 19 pandemic
* FISpH Framework for the Implementation of Services in pHarmacy (Moullin 2016)	

Table 3 lists 14 implementation factors that were deemed important, and Table 4 lists 13 implementation factors deemed changeable by the 4 groups. 6 implementation factors were ranked as important and as changeable. The top 3 factors in terms of importance and changeability were the same for both criteria. These were: (1) (Regular) Staff training on correct vaccination procedure / to perform hands-on injection technique; (2) Training in basic life support / first aid (Cardiopulmonary resuscitation), and; (3) Definition of process, roles and responsibilities in the team. In addition, (4) Hygiene concept (general for the vaccination site; separation from infected people); (5) (Regular) Staff training on correct patient risk assessment for vaccination and; (6) Room/Space for vaccination (external flat/containers/office spaces/hotels) were considered both as important and changeable.

Table 3

Implementation factors ranked by importance

Implementation factors: Importance	FISpH constructs	Group			
		A	B	C	D
(Regular) Staff training on correct vaccination procedure / to perform hands-on injection technique*	External support and/or assistance	5	5	5	5
Training in basic life support / first aid (Cardiopulmonary resuscitation) *	External support and/or assistance	4			4
Definition of process, roles and responsibilities in the team*	Teamwork			4	2
Room/Space for vaccination (external flat/containers/office spaces/hotels) *	Layout & workflow	3	2		
Pharmacy workforce	Staff		4		
Information on vaccination status: Vaccination Passport (or access to online tool of health care system)	External support and/or assistance				3
Appointment system (online booking of vaccination time slots for citizens)	External support and/or assistance			3	
(Regular) Staff training on correct patient risk assessment for vaccination*	External support and/or assistance		3		
Staff, including technicians, nurses, pharmacists, students (medicine, pharmacy)	Staff	2			
Hygiene concept (general for the vaccination site; separation from infected people) *	Layout & workflow			2	
Patient acceptance for vaccination (local population beliefs)	Community's perception about innovation and organisation			1	
(Regular) Staff training on correct monitoring procedures after vaccination	External support and/or assistance		1		
Remuneration to set-up/prepare for service implementation	Remuneration	1			
Inclusion and exclusion criteria for vaccination (risk factors) - check list and priority lists	Quality assurance system				1
Note: 5 indicates highest, 1 indicates lowest importance; implementation factors without a ranking number were considered less important by the respective groups.					
* Indicates factors that were rated as high importance and changeability					

Table 4

Implementation factors ranked by changeability

Implementation factors: Changeability	FISpH constructs	Group			
		A	B	C	D
(Regular) Staff training on correct vaccination procedure / to perform hands-on injection technique*	External support and/or assistance	5	3	5	5
Training in basic life support / first aid (Cardiopulmonary resuscitation) *	External support and/or assistance	3			4
Definition of process, roles and responsibilities in the team *	Teamwork	1		2	2
Provide information/leaflets to patients about possible ADR and instructions what/where to report	Design quality & packaging	2		3	
Hygiene concept (general for the vaccination site; separation from infected people) *	Layout & workflow		5		
Patient awareness of the service	Community's perception about innovation and organisation	4			
FAQ sheet / database for pharmacy staff	Access to knowledge and information			4	
(Regular) Staff training on correct patient risk assessment for vaccination *	External support and/or assistance		4		
Expertise in recognised inclusion and exclusion criteria for vaccination (risk factors) - check list	Technical skills (experience, capacity & competence)				3
Software to register vaccination to link to national surveillance system	Available resources and training		2		
Follow up of patients for 2nd dose	Data management system			1	
Storage space (fridge), open vial	Available resources and training				1
Room/Space for vaccination (external flat/containers/office spaces/hotels) *	Layout & workflow		1		
Note: 5 indicates highest, 1 indicates lowest changeability. Implementation factors without a ranking number were considered less changeable by the respective groups.					
* Indicates factors that were rated as high importance and changeability					

In total, 6 of the 14 implementation factors rated in the participants top 5 factors for importance were related to "External support and/or assistance". "Remuneration" was an additional implementation factor

rated as important at the external system level. 6 implementation factors related to pharmacy/organisational level, with the final factor being at the local setting level related to the community/patients' perception or acceptance of the vaccination programme. On the contrary, in terms of changeability only 3 implementation factors were related to the external system (all coded as "external support and/or assistance"), while 7 were at the pharmacy/organisational level (coded within "available resources and training", "data management system", "teamwork", "layout & workflow"), and one factor related to the innovation ("Design quality and packaging"), the individual/staff level ("technical skills" (experience, capacity & competence)) and local setting (community/patients' perception or acceptance of the vaccination programme) respectively (Table 5).

Table 5
Spread of implementation factors across FISpH domains

Rating criterion	Important	Changeable
Innovation (vaccination programme)	-	1
Individual (staff)	-	1
Organisation (pharmacy)	6	7
Local Setting	1	1
External System	7	3

Discussion

Several implementation factors must be considered to enable successful implementation of COVID-19 vaccination programmes in community pharmacy. These factors can help decision makers to decide and prioritise implementation strategies during the implementation process. Factors can present as barriers or facilitators depending upon the country's unique health care systems. As such, it is essential each country contextualises the implementation factors for their own setting to develop evidence-based implementation strategies.

To decide on the most important and most changeable implementation factors for a COVID-19 vaccination programme in EU community pharmacies, a workshop was performed at the PCNE Working Symposium in February 2021. Key implementation factors identified by the 23 workshop participants from 11 different countries were related to staff training in vaccination, staff training in basic life support (in case of adverse events), and workflow of the pharmacy.

As pharmacists are not currently providing vaccines across all EU countries, training to ensure pharmacy staff have sufficient capability and capacity is necessary. Trainings could be performed combining online material and demonstration videos along with face-to-face practicum on the application procedure [34]. Pharmacy staff must also be prepared to deal with anaphylactic events due to injection reactions and thus ensure patient safety [34, 12, 35]. In this study "staff training" was identified as the most important

and changeable implementation factor. It is interesting to note, “Staff training” can be considered as either an organisational or internal factor, if such training would be delivered within a pharmacy or pharmacy chain, or a system or external factor, if a professional organisation or national body were to develop and deliver such training. Implementation science acknowledges the fluidity of constructs across contexts and that the interface between inner and outer setting is dynamic [36].

Besides the practical skills and knowledge, it is essential the vaccination service is integrated into the workflow of the pharmacy including defining roles and responsibilities within the team. As pharmacies implement COVID-19 vaccination programmes, there will be additional workload including logistics, storage, and appointment management. The FIP has developed a guidance document detailing these aspects with regard to vaccination programmes in community pharmacy in general [37].

This study highlights implementation factors, which require corresponding implementation strategies in EU countries. However, the NGT process and findings may be useful for other countries. This study provides a list of potential implementation factors, which may help to develop, improve, and revisit strategies for new and existing COVID-19 vaccination programmes. It may also assist in post-evaluation implementation research of COVID-19 vaccination programmes in countries where the vaccine(s) have already been rolled out in community pharmacies.

Adaptation of an online NGT process

While NGT has been employed for a range of health care questions it is usually associated with face-to-face meetings [38–40]. However, an online approach can reach the same quality of outcomes [41]. In this study the online NGT facilitated the collaboration of international participants during a global pandemic and enabled consensus on the key implementation factors. Video conferencing together with expert facilitation meant communication and discussion flowed easily. During the online NGT, all participants had a chance to express their opinion equally and therefore objective conclusions emerged. Group consideration of individual ideas made this method transparent. To standardise the process, the NGT steps as outlined were followed with spreadsheets documenting the progress. In addition, the online process was both time and cost efficient as participants were not required to travel which is particularly advantageous and pronounced when international collaboration is desired [27].

Strengths And Limitations

A strength of this study was the diverse participant group. The workshop was attended by participants from 11 countries, with backgrounds across academia, a range of clinical practices, and professional organisations, which provided a rich distribution of perspectives and factors. The diverse group could also be seen as a limitation as implementation factors are context dependent, particularly their importance and changeability. In addition, as discussed, factors may be situated and addressed by different levels of the system depending on the context.

A further strength and limitation of the study, and NGT in general, is the necessity for the research question to be specific and narrow to produce meaningful results. Hence, the research question focused only on vaccines stored between 2–8°C, programmes that take place in community pharmacies in Europe and assumes countries have the legislation in place for vaccination programmes to occur in community pharmacies. To be inclusive of Low- and Middle-Income Countries would have resulted in a list of implementation factors that would have been too broad to be useful. We recommend the process is repeated for these settings.

Due to time constraints and time zone differences, only brief periods of time were possible for collation, clarification, removal of duplicate items, and prospective classification of items under an implementation framework. Additional time to ensure consistent wording of implementation factors would have been beneficial. Furthermore, due to time, final group consensus on the 5 most important and changeable factors was not reached by discussion, but rather was appraised by the 4 sub-group ratings. A factor was considered as overall important or changeable if either a high rate was given by one group, which depicts the importance of the factor for that particular group, or if multiple groups selected the factor [42].

Finally, when the authors were mapping the implementation factors to the respective constructs in the FISpH it became clear that due to the European context of this project more differentiation in the external system of FISpH would be useful. The FISpH was originally developed using practice research in Australia where external influences on service implementation in community pharmacies are less dominant. For example, it would be valuable if the construct “external support and / or assistance” was subdivided into “regional pharmacy chambers”, “national pharmacy board” and “owners’ associations”.

Conclusion

An online NGT process enabled international collaboration in gathering diverse perspectives on the implementation of COVID-19 vaccination programmes in a time and cost-efficient manner. The process was effective in identifying implementation factors and finding solutions. Online NGT processes may be suitable for other problems, not only during a pandemic.

Declarations

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Conflicts of interest/Competing interests:

The authors declare no conflicts of interest.

Authors' contributions:

EP, TFC and JCM designed the study and facilitated the workshop. DM and AI conducted the thematic coding, which was endorsed by JCM. DM, AI, LF, IT drafted the manuscript. All authors read and edited the final manuscript.

Ethics approval:

The project was exempt from Ethics approval as clarified by the Ethics Committee Northwest and Central Switzerland (Req-2021-00147; 10.2.2021)

Consent to participate:

Verbal consent was obtained from all workshop participants.

Consent for publication:

Verbal consent for publication of the workshop process and results was obtained from workshop participants. Participants were sent the final manuscript draft for comment.

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*PCNE members

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Figures

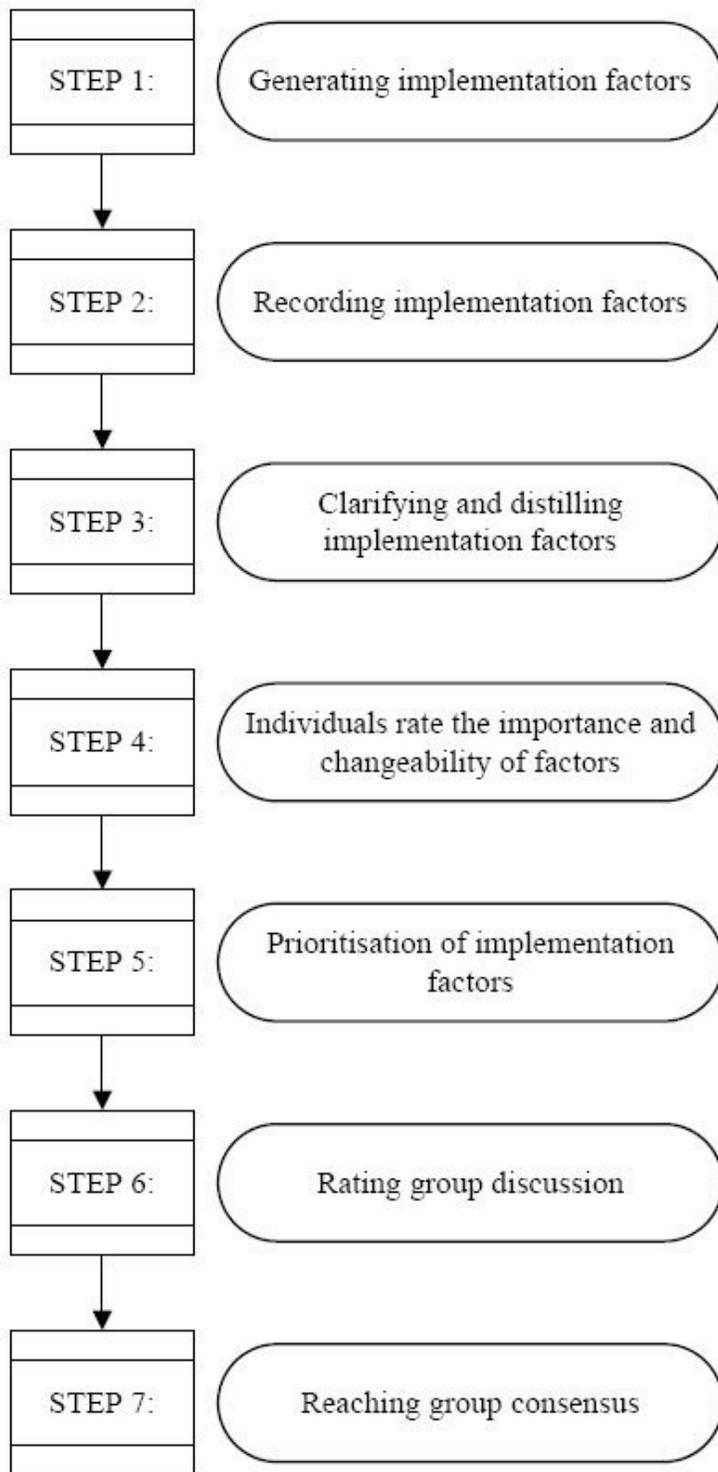


Figure 1

Flow chart of the conducted online NGT