BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-028228
Article Type:	Research
Date Submitted by the Author:	29-Nov-2018
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Keywords:	QUALITATIVE RESEARCH, PRIMARY CARE, Public health < INFECTIOUS DISEASES

'I don't think anybody explained to me how it works': Experiences of accessing vaccinations and primary health services amongst Polish and Romanian communities in England

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Word count: 3420

Keywords: Vaccination; Polish communities; Romanian communities; England; Vaccination attitudes and behaviours; Primary health care

ABSTRACT

Objectives: This study explored vaccination attitudes and behaviours amongst Polish and Romanian communities, and related access to primary healthcare services.

Design: A qualitative study using in-depth semi-structured interviews with Polish and Romanian community members (CMs) and healthcare workers (HCWs) involved in vaccination in areas with large Polish and Romanian communities. CMs discussed their vaccination attitudes and their experiences of accessing vaccinations in England. HCWs shared their experiences in vaccinating Polish and Romanian communities.

Setting: Recruitment focused on 3 geographical areas in England with large Polish and Romanian populations (in London, Lincolnshire and Berkshire).

Participants: 20 Polish and 10 Romanian CMs, and 20 HCWs. Most CMs were mothers or pregnant women and were recruited from London or Lincolnshire. HCWs included practice nurses, health visitors, and school nurses recruited from targeted geographical areas.

Results: Although most CMs reported vaccinating according to the UK schedule, obstacles to vaccination were highlighted. CMs experienced difficulties navigating and trusting the English primary healthcare system, and challenges in accessing credible vaccination information in Polish and Romanian. CM vaccination expectations, largely built on knowledge and experiences from Poland and Romania, were often unmet. This was driven by differences in vaccination scheduling and service provision in England, such as nurses delivering vaccines instead of doctors. CMs reported lower acceptance of the influenza vaccine, largely due to perceptions around the importance and efficacy of this vaccine.

HCWs reported challenges translating and understanding vaccination histories, overcoming verbal communication barriers, and ensuring vaccination schedule completeness amongst families travelling between England and Poland or Romania.

Conclusions: This study identified vaccination uptake and delivery issues and recommendations for improvement. HCWs should discuss health service expectations, highlight differences in vaccination scheduling and delivery between countries, and promote greater understanding of the English primary healthcare system in order to encourage vaccination in these communities.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- As the first study to explore vaccination attitudes and behaviours amongst Polish and Romanian communities in England, this research has highlighted key factors affecting vaccination access amongst these communities and how these can be addressed.
- Conducting interviews with community members and health workers allowed for the exploration of barriers to both vaccination access and delivery.
- Due to challenges in recruiting community members, the study was advertised via social media and our recruitment expanded beyond our targeted geographical areas. Several comments received via social media on Romanian pages appeared to reflect a mistrust in taking part in research and anti-vaccination attitudes.
- The study may not have captured vaccination behaviours that are particularly reflective of recent migrants. Our community member participants were generally engaged with health services and had good English language skills. Users of social media may also not be representative of Polish and Romanian communities.

INTRODUCTION

Protecting populations against vaccine-preventable diseases requires immunisation programmes to achieve high vaccination coverage. The measles outbreaks that affected over 20,000 people and resulted in 35 fatalities in Europe between 2016 and 2017[1, 2], are a reminder of the consequences of failing to achieve this. To optimise vaccination coverage and protect populations against vaccine-preventable diseases, it is essential for healthcare workers and vaccination programme managers to understand and address barriers to vaccine uptake within specific populations. Migration is a recognised risk factor for under-vaccination[3], with factors such as cultural and language barriers, and unfamiliarity with destination country health systems, hindering vaccination access[3, 4]. This potentially leaves migrant populations vulnerable to vaccine-preventable diseases[5].

Since the expansion of the European Union (EU) to include the EU8 countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia) in 2004, and EU2 countries (Romania and Bulgaria) in 2007, the Eastern European (EE) born population in the UK has consistently increased[6] (Figure 1). In 2017, Polish and Romanian were the most common non-British nationalities in the UK[6].

Despite the sizeable Polish and Romanian population in the UK, there is limited evidence about vaccination uptake in these communities[7]. In England, as well as other European countries, a barrier to health research involving EE communities is the lack of a systematic way to identify such

individuals in health-related datasets. Where vaccination uptake has been explored by ethnicity, a concept often linked to migrant status[9], this has largely included broad ethnic categories (e.g. "White Other") and not specific nationalities or countries of birth[10-13]. One Traveller study specifically explored vaccination uptake amongst Romanians that also identify as Roma[8], a distinct ethnic and cultural group that have experienced extensive discrimination, persecution, and marginalisation across Europe. This Traveller study highlighted that amongst Roma participants language and literacy were particular barriers to accessing vaccines and health services[8].

To our knowledge, no research has specifically focused on vaccine-related attitudes and behaviours among EE communities in England, despite differences in vaccination schedules[2, 9] (Table 1), and variations in vaccination coverage[10] (Table 2) and vaccine confidence between countries[11]. This study explored vaccination attitudes and behaviours amongst Polish and Romanian community members (CMs) in England, and related access to primary healthcare (PHC).

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Table 1: Comparison of childhood and adult vaccination schedules in Poland, Romania and the UK [2, 9]

	UK	*Poland*	*Romania*
Tuberculosis (BCG)	Infants in areas of the country with TB incidence >= 40/100,000. For infants with a parent or grandparent born in a high incidence country.	**Mandatory**, administered within 24hrs after birth.	Within 2-7 days after birth.
Rotavirus	2 and 3 months.	Not funded by the National Health system. Recommended at 6 weeks and 2, 3, 4, 5 and 6 months.	
Diphtheria	2, 3 and 4 months and 3 and 14 years.	**Mandatory** at 2, 4 and 5-6 and 16 months and 6, 14 and 19 years.	2, 4 and 11 months and 6 and 14 years.
Tetanus	2, 3 and 4 months and 3 and 14 years.	**Mandatory** at 2, 4 and 5-6 and 16 months and 6, 14 and 19 years.	2, 4 and 11 months and 6 and 14 years.
Pertussis	2, 3 and 4 months, 3 years and for pregnant women.	**Mandatory** at 2, 4 and 5-6 and 16 months and 6 and 14 years.	2, 4 and 11 months and 6 years.
Poliomyelitis	2, 3 and 4 months and 3 and 14 years.	**Mandatory** at 4 and 5-6 and 16 months and 6 years.	2, 4 and 11 months and 6 years.
Haemophilus influenzae type b infection	2, 3, 4 and 12 months.	**Mandatory** at 2, 4 and 5-6 and 16 months.	2, 4 and 11 months.
Hepatitis B	Infants born to hepatitis B infected mothers at birth, four weeks and 12 months old. General population at 2, 3 and 4 months.	**Mandatory**, administered within 24hrs after birth and at 2 and 7 months.	2-7 days after birth and at 2, 4 and 11 months.
Pneumococcal disease	2, 4 and 12 months (PCV) and for adults aged 65+ years (PPV).	**Mandatory** at 2, 4 and 13 months. Recommended but not funded by the National Health system for adults aged 50+ years.	2, 4 and 11 months.
Meningococcal disease	MenB at 2, 4 and 12 months. MenC at 12 months. Men ACWY at 14 years old	Not funded by the National Health system. Recommended at 2-6 months and 7 months to 19 years.	
Measles	12 months and 3 years. Opportunistically offered to unvaccinated or partially vaccinated children aged between 10-16 years.	**Mandatory** at 13 months and 10 years. Catch-up programme offered to unvaccinated or partially vaccinated children aged between 11-19 years.	12 months and 5 years.
Mumps	12 months and 3 years. Opportunistically offered to unvaccinated or partially vaccinated children aged between 10-16 years.	**Mandatory** at 13 months and 10 years. Catch-up programme offered to unvaccinated or partially vaccinated children aged between 11-19 years.	12 months and 5 years.
Rubella	12 months and 3 years. Opportunistically offered to unvaccinated or partially vaccinated children aged between 10-16 years.	**Mandatory** at 13 months and 10 years. Catch-up programme offered to unvaccinated or partially vaccinated children aged between 11-19 years.	12 months and 5 years.
Human Papillomavirus infection	Females aged 12-14 years.	Females aged 11-13 years.	Not funded by the National Health system. Recommended for females aged 11-14 years.
Influenza	Children aged 2-8 years. Pregnant women during flu season. Annually for adults aged 65+ years.	Not funded by the National Health system but recommended from 6 months to 18 years and for adults aged 55+ years.	Not funded by the National Health system but recommended for adults aged 65+ years.
Herpes zoster (Shingles)	Adults aged 70+ years.		

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Table 2: WHO-UNICEF estimates of vaccination coverage (%) in Poland, Romania and the UK in 2016 [10]

	Vaccine												
	BCG	DTP1	DTP3	HepB3	HepB_BD	Hib3	IPV1	MCV1	MCV2	PCV3	Pol3	RCV1	RotaC
Poland	94	99	98	96	93	98	-	96	94	-	92	96	-
Romania	84	96	89	90	93	89		86	76		89	86	
UK		98	94	-	-	94		92	89	92	94	92	90

METHODS

Theoretical framework

The Social Ecological Model (SEM) was adopted as a theoretical framework to underpin this study and guide the identification of barriers to vaccination uptake, and areas for focusing policy and practice recommendations[12]. The SEM acknowledges that health behaviours, such as vaccination uptake, are shaped by multiple factors at the following levels: intrapersonal/individual (e.g. knowledge, attitudes), interpersonal (e.g. family, friends), institutional (e.g workplaces), community (e.g. neighbourhoods, community groups, local organisations) and policy (e.g. laws, national or local policies)[12]. The SEM has previously been used in the context of vaccination behaviours[20-22].

Recruitment and data collection

We conducted in-depth semi-structured interviews with Polish and Romanian CMs and healthcare workers (HCWs) involved in the provision and delivery of vaccinations in areas with high Polish and Romanian populations. Recruitment focused on 3 geographical areas (Boston, Lincolnshire; Slough, Berkshire; Brent, London)[6, 13].

CMs were identified through community venues (including schools, nurseries and churches), and advertisements in Polish newspapers, Eastern European shops and via Twitter and Facebook pages. Parents, grandparents, and adults eligible for the influenza vaccine could participate. CMs were compensated with a £10 gift voucher. We identified HCWs via general practices and community providers. Potential participants were given an information sheet, fully detailing the study objectives and explaining all aspects of participation, including the right to withdraw from the research.

Participants were interviewed in person or via telephone. CMs were offered the option of being interviewed in English, Polish, or Romanian. Interviews were audio-recorded and reflective notes

were taken during interviews. Face-to-face interviews were conducted with CMs in community venues (e.g. libraries and quiet coffee shops) in a location convenient for the participant. Face-to-face interviews with HCWs were performed in workplaces, in quiet environments away from clinical areas. Most interviews with CMs lasted 30-60 minutes, and approximately 20-40 minutes with HCWs.

CMs were asked about their vaccination and related PHC experiences. HCWs were interviewed about vaccination service delivery to Polish and Romanian service users. CMs and HCWs were solicited for service improvement suggestions. Interview topic guides were developed for this study with community involvement.

Public involvement

A Polish community group were involved in the development of study documents, including the topic guides, and were asked to provide feedback on recruitment strategies. This involvement aimed to increase the relevance and usefulness of the study, and help to promote study recruitment.

Data analysis

Interviews were transcribed verbatim and analysed thematically using the stages outlined by Braun and Clarke[14]: data familiarisation, coding, and theme identification and refinement. To enhance the rigour of the analysis, coding approaches and data interpretations were discussed between SB, MZ and SMJ.

Interviews were coded using initial codes generated from the interview topic guide and categories of the SEM. During theme generation, a matrix was created using the categories of the SEM to identify areas for focusing policy and practice recommendations[12].

Research team and reflexivity

This research was led by SB, a postdoctoral researcher at the London School of Hygiene & Tropical Medicine (LSHTM). The researchers had no connection with the research participants prior to commencing the study. SB had a clinical background, having worked as a nurse in haematology and oncology. The team had academic research (SB, MZ, ME, MR, SMJ) and clinical or public health backgrounds (SB, ME and MR). SB, SMJ and MZ were based at LSHTM at the time of the study, and ME and MR at Public Health England (PHE). SB, ME, MR and SMJ conducted this study as part of the Health Protection Research Unit in Immunisation, a collaboration between LSHTM and PHE.

FINDINGS

Participants

Twenty Polish and 10 Romanian CMs and 20 HCWs were interviewed (Table 3). 3 interviews were conducted in Polish by MZ and the remaining interviews were performed by SB. Detailed CM characteristics are outlined in supplementary table 1. Most CMs were mothers or pregnant women (n:28). CMs were recruited via social media (n:22), a Polish newspaper (n:2), a community group (n:1), a children's club (n:1), and through word-of-mouth (n:4). The use of social media meant recruitment was not geographically restricted, most CMs were recruited from London or Lincolnshire.

One HCW was recruited from an area not originally targeted for recruitment (table 3) because of strong experience in working with EE communities. In addition to NHS HCWs, we also recruited a vaccination advisor (HCW#17) who led an online Romanian vaccination forum organised by medical professionals.

No repeat interviews were performed and no participants withdrew from the study.

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Table 3: Healthcare worker and community member participants

Healthcare workers		
Region	**No. of interviews conducted**	**Roles of interviewees**
Slough, Berkshire	6	Specialist health visitors, specialist nurses focused on health inequalities and practice nurses
Brent, London	5	Practice nurses
Boston, Lincolnshire	7	School nurses, practice nurses, and a general practice administrator
Hillingdon, London	1	Health visitor
Other	1	Vaccination advisor
Community members		
Community members		**No. of interviews conducted**
Polish participants		20
Romanian participants		10

Barriers to vaccine uptake, vaccination delivery, and PHC access

CMs mostly reported accepting vaccines according to the UK schedule, although the influenza vaccine was more often declined (Table S1). CMs reported struggling with the vaccination decision-making process, which involved the evaluation of perceived potential benefits and risks.

We present vaccination specific and wider PHC barriers identified by CMs and HCWs to vaccine uptake and delivery under seven main themes spanning each level of the SEM.

Challenges to navigating the health system

CMs perceived the English PHC system as markedly different to systems in Poland and Romania. Several CMs reported challenges in registering with general practices due to uncertainties around entitlement to care, and difficulties in producing proof of address as requested by some practices. CMs explained that in Poland and Romania service users would more often directly access specialist pay-for-services, bypassing general practitioners (GPs). PHC in England was viewed as a hindering process instituted to restrict access to secondary care and cut costs.

> *'….in Poland a GP is a GP and they accept the fact that they are GPs, so if they cannot deal with something they will very easily refer you somewhere else…. If you feel dizzy or you've got a headache, they will send you to a neurologist. It's not a problem. Here, trying to get a referral somewhere is just like God help you.' (CM#10 - Polish mother, Cornwall)*

Transnational use of health services

CMs often reported ongoing use of health services in Poland and Romania, in some instances this was done to avoid relying on PHC in England to gain direct access to secondary care. CM families were also reported to travel to Poland or Romania prior to or in the weeks following the birth of a new-born, to see family and receive healthcare. Some families vaccinated their children during these visits due to the timing of their travel.

Vaccinating children in more than one country could cause disruption the UK immunisation schedule. HCWs faced challenges in determining which vaccines had been administered to the child, with many returning to England with undocumented vaccination histories. Polish participants also suggested that some families prefer to access certain vaccinations in Poland.

> *'…. there were some vaccinations we did in Poland because it was cheaper, like chicken pox for [our daughter] …. I think it was £100 here or something like that. I*

think we paid half in Poland…. we managed to get it when we were on holiday. '

(CM#18 - Polish mother; Lincolnshire)

Language and literacy

Communication barriers during PHC consultations were reported by both HCWs and CMs. The latter particularly struggled with HCW use of medical terminology and jargon, and the inability of health services to provide information in languages other than English. To overcome language barriers several HCWs reported using online translation tools to aide communication. HCWs considered that more 'formal' modes of communication such as telephone or face-to-face interpreting services were difficult to organise, felt impersonal, and created greater uncertainties around messages becoming lost in translation.

Similarly, HCWs struggled to translate vaccination histories. This was a time-consuming process and one, as HCWs suggested, which would be better completed by an alternative service prior to attendance at the practice. Some HCWs reported relying on colleagues with Polish or Romanian language skills, including multi-lingual receptionists, to translate documents. In some instances, practices had developed vaccine "crib sheets", providing the names of vaccinations in Polish and Romanian, to help during consultations.

Most CMs reported that they were not offered, or directed towards, vaccination and broader health information in their native language. CMs and HCWs recommended that vaccination information be made available in different languages, but there was recognition that cost could be a barrier. An additional challenge in working with Roma Romanian communities was overcoming literacy barriers. With those groups, HCWs found that face-to-face verbal communication, involving interpreters, was the best approach.

Expectations of vaccination delivery

Without a prior understanding of vaccination delivery in England, CMs based their expectations on knowledge and experiences in Poland and Romania. This meant their expectations were often unmet because of differences in vaccination programmes (Table 1), HCW roles and interactions in vaccination appointments.

Comparison of vaccination programmes in the UK, Poland and Romania

Both CMs and HCWs noted that existing variations in vaccines and scheduling between national programmes led to uncertainties. For example, confusion arose for Hepatitis B vaccine, which has been widely available in Europe but was only recently introduced routinely in the UK[15], and BCG

vaccination that is not universally offered in the UK[16]. Polish parents reported unease at not receiving the BCG vaccination for their children, as Poland is not classed by Public Health England as having a high TB prevalence[17].

The number of childhood vaccinations administered within a short space of time was also reported as a concern by parents. Some CMs argued that in Poland and Romania some vaccines could be available with a choice of formulations, such as measles, mumps and rubella either freely as three separate jabs or for a fee in one jab, while the NHS only administered the combined 3-dose MMR vaccine. Similarly, choice was also provided in Poland and Romania between vaccine brands, albeit at a cost when administered by private providers. Branded vaccinations were reportedly portrayed as better.

> *'...the GP [In Romania] told us, "just use this one." I think [the GP] might have told us, "If you want," you know, "I can give you this standard free of charge one. If you want your real one, you just go to the pharmacy, buy it, bring it, we'll do it, off you go." (CM#4 – Romanian father, Maidenhead)*

Difference in consent for vaccines in schools was highlighted between England and Romania by one HCW. It was reported that providing written consent in England could be off-putting to parents not used to this particularly formalised approach, which made vaccinations appear riskier.

Vaccine administration

Polish participants discussed that in Poland vaccines are administered by doctors, while in England this role is performed by nurses. Some Polish participants were concerned that nurses in England might not be qualified for this role. Polish mothers also highlighted concerns that children were not given a physical examination before vaccine administration. Instead, it was reported that the onus on whether vaccinations should be given was placed on the parent, who was asked whether their child was healthy.

> *'I do not like it, for example, that children are not tested (checked) before vaccination. [The decision to give the vaccination] depends on the parent's opinion whether the child is healthy or not, but it is sometimes difficult to really judge whether a child is healthy, if he or she goes with a cold, or I do not know, with something.' (CM#12 – Polish mother, Wellingborough)*

One Polish parent also reported that children attending vaccination services in Poland would wait in a separate area to symptomatic patients. The absence of segregated areas between healthy and sick patients in GP practices in England was found to be alarming.

Vaccine acceptance

Although most CMs regarded vaccines as essential for protection against disease, certain vaccines created greater concern or were considered less important than others. Several participants voiced higher apprehension around 'newer' vaccines that were considered not to have been in use for enough time to be considered safe. Both MMR and the influenza vaccines were either considered unimportant or generated particular concerns. The hesitancy related to MMR was linked to the Wakefield controversy [18], but was reported not to be at any greater level than in the general population. Influenza was the dominant vaccine that CMs reported refusing (Table S1). Refusals were mainly based on the perception that this vaccine is unnecessary or not as important as other vaccines. Influenza was considered less serious compared to other vaccine-preventable diseases.

It did not appear that messages surrounding the larger societal benefits of influenza vaccination had been received. Several CMs also reported concerns that having the influenza vaccine could cause flu-like side effects.

Accessibility of vaccines

Appointment booking and appointment length

CMs reported that it was straightforward and easy to book vaccination appointments at GP practices; however, dissatisfaction was often noted around the time allocated. Similarly, HCWs considered it generally difficult to provide vaccine information, administer vaccines and document vaccine delivery within the time allotted (approximately 10-15 minutes), and this was made even more challenging because of communication barriers.

The time-restriction on appointments made some CMs feel rushed and not listened to, potentially leaving them with questions and vaccine concerns that were not addressed. Interviewees reported that this could generate tensions.

Vaccination reminders

Although vaccination acceptance was high, HCW reported that attendance dwindled for EE children after vaccinations at eight and twelve weeks.

CMs reported not always receiving vaccination reminders. There was a lack of consistency in the approaches used by practices in delivering vaccination recalls and the onus appeared to be primarily

on the parents to book and remember appointments. Given the frequent travel of Polish and Romanian families to their home countries, appointments were easily missed.

Trust

'Social' trust in institutions and 'interpersonal' trust in individuals, terms used by Mechanic and Schlesinger [19], can be applied to underpin confidence in vaccines, vaccine delivery and health services. CMs discussed trust in relation to health authorities, the pharmaceutical industry, and HCWs. Trust was partially shaped by different expectations of health services and a lack of understanding or regard for how the English PHC system works.

CMs reported challenges in accessing and sourcing trustworthy vaccination information, amidst a barrage of well-written unregulated sources that appear using Google searches, through parent forums, and on social media. Most CMs trusted HCWs advice on vaccines and the literature sources produced by the NHS on vaccinations, which was considered more credible than other sources. However, some seemed more sceptical about the quality of healthcare more generally.

> *'I have more confidence in the doctor in Poland. Doctors in Poland are trained doctors. They study medicine for several years….Here, I have the impression that a doctor….they have everything on the computer. He's typing in a computer that you come, have a cold, a fever, and [it] jumps out [from the computer], what he has to give me.' (CM#12 – Polish mother, Wellingborough)*

Lack of trust in PHC was a driving factor for people opting to access emergency services in England and for seeking care in Poland and Romania or private Polish doctors in England.

To promote trust in health services and HCWs it was considered crucial for HCWs to explain the system to service users. With some particularly self-contained and less integrated communities (e.g. Roma Romanians), HCWs reported that engagement was more effective using out-reach strategies (e.g. door-knocking, approaching community groups) rather than trying to encourage health service attendance.

DISCUSSION

We found that vaccination attitudes and behaviours amongst CMs were influenced by multiple interconnected factors. These included language barriers, perceptions about vaccine safety and importance, and expectations around vaccination services and PHC.

Overall, the reported influence of language barriers, population transiency, negative perceptions of healthcare professionals, poor understanding of healthcare entitlements, work-life demands and lack of integration on PHC experience were consistent with the literature[20-27]. Previous research also highlights that migrants may prefer to access health services in their country of origin due to negative perceptions of the English PHC system[24] and greater confidence in their own country's doctors[26].

We found that vaccination and healthcare experiences in Poland and Romania shaped expectations of services in England. Differences in service provision in England, such as vaccine delivery by nurses, were met with uncertainty and anxiety. The variations in vaccination schedules across countries which caused concern among our participants, are likely to affect migrant populations in other countries.

Influenza vaccination was commonly refused due to perceptions around its importance and efficacy. It is not clear whether influenza vaccination refusal is more prominent amongst Polish and Romanian communities. This warrants further exploration, particularly as confidence in vaccines has been decreasing in many European countries, most notably in Poland[11].

We have identified key recommendations intended to improve vaccination and health service access by Polish and Romanian communities (Table 4), many of which would be transferable to other European countries where these communities have also settled. While some of these recommendations incur additional staff time and costs, they should be placed in the broader context of ensuring high uptake and reducing the likelihood of disease outbreaks in these communities.

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Table 4: Key recommendations linked to study findings and levels of the Social Ecological Model

Theme	Sub-theme	Level of Social Ecological Model	Key Recommendations
Integration	Navigating the health system	Intrapersonal, Interpersonal, Institutional, Community, Policy	• HCWs to explain how the health system works in England[28]and clarify expectations, notably for new migrants who register at general practices. • Out-reach vaccination approaches for those that do not access health care.
	Language and literacy	Intrapersonal, Institutional	• Vaccination and broader health literature made available in translated forms[3]. • Information provided using pictograms or pictures to help overcome literacy barriers. • Out-reach vaccination approaches, involving an interpreter, to reach groups that face language and literacy barriers. • Improved access to interpreting and translation services[3]
	Transnational use of health services	Intrapersonal, Interpersonal, Community	• Discuss future travel to avoid missing or delaying vaccines [29] • HCWs to ask new residents about their vaccine history and record it and offer vaccinations to people unable to provide evidence of vaccination [4, 29-31].
Expectations of vaccination delivery	Comparison of vaccination programmes	Intrapersonal, Interpersonal, Institutional, Community, Policy	• Differences in vaccination schedules and consent to be highlighted and discussed by HCWs. • HCWs to encourage open communication around vaccines and vaccination delivery, particularly with those that are unfamiliar with the English health system. • Views and expectations of all service users should be used to shape services.
	Consent		
	Administration of vaccine		
Acceptance of vaccines	Perceived safety of MMR	Intra-personal, Inter-personal, Community	
	Importance of influenza (flu) vaccine		
Accessibility of vaccines	Appointment booking and length	Institutional,	• Longer appointment slots when there are language barriers.
	Vaccination reminders	Institutional	• Vaccination reminders given during health visitor appointments and general practice visits. • Vaccination reminders in Polish and Romanian.
Trust	Trust in healthcare workers	Institutional	• HCWs and CMs to discuss service expectations and acknowledge differences in systems. • Direction to credible vaccination sources. • Encourage discussion around vaccine concerns.
	Trust in vaccinations and pharmaceutical industry	Institutional	

CONCLUSION

Overall, CMs reported accepting vaccination; however, several barriers to uptake were identified. These included difficulties in navigating and trusting the English health system, language barriers and challenges in accessing credible vaccine information in translated forms. Concerns around vaccine importance and efficacy were raised by CMs for influenza vaccine, which led to lower acceptance.

HCWs reported difficulties in translating and understanding vaccination histories, ensuring vaccination schedule completeness amongst families frequently traveling between England and Poland or Romania, and overcoming verbal communication barriers.

In a context where external and internal migration has been growing in England and across Europe, and several measles outbreaks have occurred over the past few years, it is important that HCWs promote an open dialogue with service users to discuss vaccination and health service expectations. Crucially, providers are recommended to routinely obtain and record vaccination histories, explain differences in vaccination delivery and scheduling, and consider vaccine schedule travel disruptions.

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FOOTNOTES

Abbreviations

CM, community member; HCW, healthcare worker; EU, European Union; EE, Eastern European; GP, general practitioner; UK, United Kingdom

Contributors

The study was designed by SB, ME and SMJ. SB was responsible for data collection and analysis. SB and MZ conducted the interviews. SB, MZ and SMJ were involved in data analysis. SB, MZ, ME and SMJ were involved in the interpretation of findings. SB produced the first draft of the manuscript; all authors contributed to revisions of the manuscript and gave final approval for the study to be published.

Acknowledgements

We would like to thank the research participants and members of the public involvement group. We thank Vanessa Saliba for providing helpful feedback and sharing her expertise during the project.

Funding

The research was funded by the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Immunisation at the London School of Hygiene & Tropical Medicine in partnership with Public Health England (PHE). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR, the Department of Health or Public Health England.

Ethical approval

The study received ethical approval from the London School of Hygiene and Tropical Medicine Observational Research Ethics Committee (Ref: 12124), the Health Research Authority (Project ID: 224734), and from Research and Development departments in the recruitment areas. Written informed consent was obtained from all study participants.

Data sharing statement

No additional data are available

Competing interests

We have non conflicts of interest to declare.

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‘I don’t think anybody explained to me how it works’: Experiences of accessing vaccinations and primary health services amongst Polish and Romanian communities in England

Figure 1

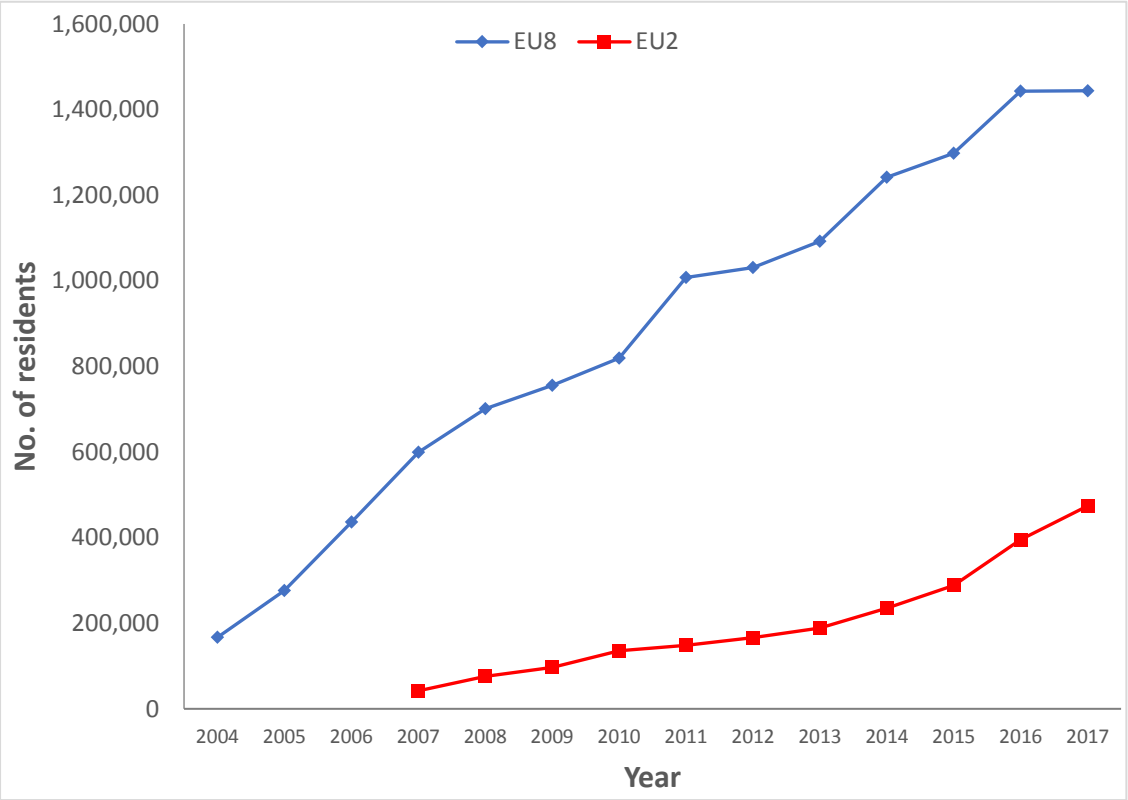

***Figure 1**. Estimated number of EU8 and EU2 born residents in the UK, 2004 to 2017. Data extracted from the Office for National Statistics [4]. Data for each year is from January-December.*

'I don't think anybody explained to me how it works': Experiences of accessing vaccinations and primary health services amongst Polish and Romanian communities in England

Supplementary file

Supplementary table 1: Polish and Romanian participants

Participant No.	Current area of residence	Gender	Years in England	Children	Reported vaccination refusals and vaccinations outside of England
Polish participants					
1	Greater London	Female	10	2.5-year-old daughter	Child fully vaccinated in England
2	Lincolnshire	Female	11	5-year-old daughter	Child fully vaccinated in England
3	Greater London	Female	10	3.5-year-old son	Child fully vaccinated. Child was born in Poland and received some early vaccinations there (first year).
5	Greater London	Female	12	34 weeks pregnant. 5-year-old son	Child fully vaccinated aside from influenza vaccination declined.
6	East Sussex	Female	9	7-year-old and 1-year old daughter	Child fully vaccinated in England.
7	Greater London	Female	12	Four sons aged 12, 5 and 3 years	Children fully vaccinated. Eldest son received some vaccinations in Poland.
8	County Durham	Male	12	Wife 37 weeks pregnant at the time of the interview (participant 9)	As someone with asthma, this participant reports receiving the influenza vaccine in England. Reports that he has no concerns about his child being vaccinated in the future.
9	County Durham	Female	12	37 weeks pregnant	Received all recommended vaccinations during pregnancy.
10	Cornwall	Female	14	10-year-old son	Child fully vaccinated in England. Participant also has influenza vaccinations annually.
11	Cornwall	Female	10	7-year-old daughter	Child fully vaccinated in England
12	Northamptonshire	Female	12	16-year-old son, 2-year-old daughter	Children fully vaccinated in England. Son had most vaccinations in Poland. Participant remembers refusing the pertussis vaccine during pregnancy.
13	Cornwall	Female	11	7-year-old son	Son received some vaccinations in England and Poland (living in Poland until the age of 4 years). Family have all received the flu vaccination as her son has Leukaemia.
14	Greater London	Female	10	8-year-old son	Child fully vaccinated aside from influenza vaccination declined
15	Lincolnshire	Female	12	4 children aged 25, 22 and twins aged 15 years	Children fully vaccinated in Poland and England.
17	Lincolnshire	Female	13	12-year-old son	Declined flu vaccination for herself. Child fully vaccinated aside from influenza vaccination declined.
18	Lincolnshire	Female	11	1 daughter aged 5 yrs. Pregnant at the time of interview.	Daughter received some vaccinations in Poland and England. Declined flu vaccination during pregnancy and for her daughter.
19	Lincolnshire	Female	12	2 children.	Children fully vaccinated in England.
20	Greater London	Female	12	5-month-old son	Received all recommended vaccinations during pregnancy and for child.
22	Greater London	Female	10	6-year-old daughter	Declined flu vaccination for herself and daughter. Received all other recommended vaccinations. Also accessed chickenpox vaccination for daughter.
23	Norfolk	Female	13	4-month-old daughter	Declined flu vaccination during pregnancy. Child fully vaccinated in England.
Romanian participants					
4	Berkshire	Male	9.5	10.5-year-old son	Child fully vaccinated. Child born in Romania and received some early vaccinations there.
16	Greater London	Male	3.5	4-month-old son	Child fully vaccinated in England.
21	Greater London	Female	11	10-year-old daughter, 3.5-year-old son	Children fully vaccinated in England.
24	Wiltshire	Female	3	2-year-old daughter	Received all recommended vaccinations during pregnancy and for her daughter
25	Greater London	Female	5	20-month-old son	Child fully vaccinated. Declined flu vaccination during pregnancy.
26	Hampshire	Female	10	13-month-old son	Child fully vaccinated. Declined flu vaccination during pregnancy.
27	Greater London	Female	8	13-month-old daughter.	Received all recommended vaccinations during pregnancy and for child.
28	Greater London	Female	11	2- year old son	Received all recommended vaccinations during pregnancy and for child.
29	Greater London	Female	18	15-month-old daughter.	As someone with asthma, reports receiving the influenza vaccine in England. Child fully vaccinated.
30	Coventry	Female	10	No children.	As someone with asthma, reports receiving the influenza vaccine in England. She also reports that her mother, in her 60s, also receives the influenza and the pneumococcal vaccine in England.

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	8
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	7- details for SE
Occupation	3	What was their occupation at the time of the study?	7
Gender	4	Was the researcher male or female?	Title page
Experience and training	5	What experience or training did the researcher have?	7
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	7
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	7
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	7
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	6-7
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	6
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	6
Sample size	12	How many participants were in the study?	7
Non-participation	13	How many people refused to participate or dropped out? Reasons?	7 - no participa
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	6
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	6 - just researc
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	7-8 and Supple
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	6
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	7
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	6
Field notes	20	Were field notes made during and/or after the inter view or focus group?	6
Duration	21	What was the duration of the inter views or focus group?	6
Data saturation	22	Was data saturation discussed?	No
Transcripts returned	23	Were transcripts returned to participants for comment and/or	No

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	7
Description of the coding tree	25	Did authors provide a description of the coding tree?	7
Derivation of themes	26	Were themes identified in advance or derived from the data?	7
Software	27	What software, if applicable, was used to manage the data?	7
Participant checking	28	Did participants provide feedback on the findings?	No
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	9-13
Data and findings consistent	30	Was there consistency between the data presented and the findings?	9-13
Clarity of major themes	31	Were major themes clearly presented in the findings?	9-13
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Yes e.g. P11

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

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BMJ Open

‘I don’t think anybody explained to me how it works’: a qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-028228.R1
Article Type:	Research
Date Submitted by the Author:	02-Apr-2019
Complete List of Authors:	Bell, Sadie; London School of Hygiene and Tropical Medicine Faculty of Public Health and Policy, Global Health and Development Edelstein, Michael; Public Health England, Department of Immunisation, Hepatitis and Blood safety Zatoński, Mateusz; London School of Hygiene and Tropical Medicine Faculty of Public Health and Policy, Department of Health Services Research and Policy; European Observatory of Health Inequalities Ramsay, Mary; Public Health England, Department of Immunisation, Hepatitis and Blood safety Mounier-Jack, Sandra; London School of Hygiene and Tropical Medicine Faculty of Public Health and Policy, Department of Global Health and Development
Primary Subject Heading:	Public health
Secondary Subject Heading:	Qualitative research, Health services research, Health policy
Keywords:	QUALITATIVE RESEARCH, PRIMARY CARE, Public health < INFECTIOUS DISEASES, Vaccination, Polish and Romanian communities

'I don't think anybody explained to me how it works': a qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England

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Keywords: Vaccination; Polish communities; Romanian communities; England; Vaccination attitudes and behaviours; Primary health care

'I don't think anybody explained to me how it works': a qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England

ABSTRACT

Objectives: This study explored vaccination attitudes and behaviours amongst Polish and Romanian communities, and related access to primary healthcare services.

Design: A qualitative study using in-depth semi-structured interviews with Polish and Romanian community members (CMs) and healthcare workers (HCWs) involved in vaccination in areas with large Polish and Romanian communities. CMs discussed their vaccination attitudes and their experiences of accessing vaccinations in England. HCWs shared their experiences in vaccinating Polish and Romanian communities.

Setting: Recruitment focused on 3 geographical areas in England with large Polish and Romanian populations (in London, Lincolnshire and Berkshire).

Participants: 20 Polish and 10 Romanian CMs, and 20 HCWs. Most CMs were mothers or pregnant women and were recruited from London or Lincolnshire. HCWs included practice nurses, health visitors, and school nurses recruited from the targeted geographical areas.

Results: Although most CMs reported vaccinating according to the UK schedule, obstacles to vaccination were highlighted. CMs experienced difficulties navigating and trusting the English primary healthcare system, and challenges in accessing credible vaccination information in Polish and Romanian. CM vaccination expectations, largely built on knowledge and experiences from Poland and Romania, were often unmet. This was driven by differences in vaccination scheduling and service provision in England, such as nurses delivering vaccines instead of doctors. CMs reported lower acceptance of the influenza vaccine, largely due to perceptions around the importance and efficacy of this vaccine.

HCWs reported challenges translating and understanding vaccination histories, overcoming verbal communication barriers, and ensuring vaccination schedule completeness amongst families travelling between England and Poland or Romania.

Conclusions: This study identified vaccination uptake and delivery issues and recommendations for improvement. HCWs should discuss health service expectations, highlight differences in vaccination scheduling and delivery between countries, and promote greater understanding of the English primary healthcare system in order to encourage vaccination in these communities.

'I don't think anybody explained to me how it works': a qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England

STRENGTHS AND LIMITATIONS OF THIS STUDY

- As the first study to explore vaccination attitudes and behaviours amongst Polish and Romanian communities in England, this research has highlighted key factors affecting vaccination uptake amongst these communities and how these can be addressed.
- Conducting interviews with community members and health workers allowed for the exploration of barriers to both vaccination uptake and delivery.
- Due to challenges in recruiting community members, the study was advertised via social media and our recruitment expanded beyond our targeted geographical areas. Several comments received via social media on Romanian pages appeared to reflect a mistrust in taking part in research and anti-vaccination attitudes.
- The study may not have captured vaccination behaviours that are particularly reflective of recent migrants. Our community member participants were generally engaged with health services and had good English language skills. Users of social media may also not be representative of Polish and Romanian communities.

INTRODUCTION

Protecting populations against vaccine-preventable diseases requires immunisation programmes to achieve high vaccination coverage. The measles outbreaks that affected over 20,000 people and resulted in 35 fatalities in Europe between 2016 and 2017[1, 2], are a reminder of the consequences of failing to achieve this. To optimise vaccination coverage and protect populations against vaccine-preventable diseases, it is essential for healthcare workers and vaccination programme managers to understand and address barriers to vaccine uptake within specific populations. Migration is a recognised risk factor for under-vaccination[3], with factors such as cultural and language barriers, and unfamiliarity with destination country health systems, hindering vaccination access[3, 4]. This potentially leaves migrant populations vulnerable to vaccine-preventable diseases[5].

Since the expansion of the European Union (EU) to include the EU8 countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia) in 2004, and EU2 countries (Romania and Bulgaria) in 2007, the Eastern European (EE) born population in the UK has consistently increased[6] (Figure 1). In 2017, Polish and Romanian were the most common non-British nationalities in the UK[6].

Despite the sizeable Polish and Romanian population in the UK, there is limited evidence about vaccination uptake in these communities[7]. In England, as well as other European countries, a

barrier to health research involving EE communities is the lack of a systematic way to identify such individuals in health-related datasets. Where vaccination uptake has been explored by ethnicity, a concept often linked to migrant status[8], this has largely included broad ethnic categories (e.g. "White Other") and not specific nationalities or countries of birth[9-12]. One Traveller study specifically explored vaccination uptake amongst Romanians that also identify as Roma[13], a distinct ethnic and cultural group that have experienced extensive discrimination, persecution, and marginalisation across Europe. This Traveller study highlighted that amongst Roma participants language and literacy were particular barriers to accessing vaccines and health services[13].

To our knowledge, no research has specifically focused on vaccine-related attitudes and behaviours among Polish and Romanian communities in England. This is despite differences in vaccination schedules[2, 14] (Table 1), vaccination coverage[15] (Table 2) and vaccine confidence between countries[16]. Notable differences in scheduling include the lack of health system funding for influenza and rotavirus vaccination in Poland and Romania, in comparison to the UK (Table 1). Also, in contrast to the UK and Romania, eleven childhood vaccinations in Poland are mandatory, with vaccination refusal leading to monetary fines (Table 1). There are also differences in vaccination coverage, which is notably much lower in Romania, compared to the UK and Poland (Table 2). Coverage with two doses of measles vaccine is particularly low in the UK (88%), and dangerously low in Romania (75%) (Table 2).

This study explored vaccination attitudes and behaviours amongst Polish and Romanian community members (CMs) in England, and related access to primary healthcare (PHC).

'I don't think anybody explained to me how it works': a qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England

Table 1: Comparison of childhood and adult vaccination schedules in Poland, Romania and the UK [2, 14]

	UK	*Poland*	*Romania*
Tuberculosis (BCG)	Infants in areas of the country with TB incidence >= 40/100,000. For infants with a parent or grandparent born in a high incidence country.	**Mandatory**, administered within 24hrs after birth.	Within 2-7 days after birth.
Rotavirus	2 and 3 months.	Not funded by the National Health system. Recommended at 6 weeks and 2, 3, 4, 5 and 6 months.	Not funded by the National Health system
Diphtheria	2, 3 and 4 months and 3 and 14 years.	**Mandatory** at 2, 4 and 5-6 and 16 months and 6, 14 and 19 years.	2, 4 and 11 months and 6 and 14 years.
Tetanus	2, 3 and 4 months and 3 and 14 years.	**Mandatory** at 2, 4 and 5-6 and 16 months and 6, 14 and 19 years.	2, 4 and 11 months and 6 and 14 years.
Pertussis	2, 3 and 4 months, 3 years and for pregnant women.	**Mandatory** at 2, 4 and 5-6 and 16 months and 6 and 14 years.	2, 4 and 11 months and 6 years.
Poliomyelitis	2, 3 and 4 months and 3 and 14 years.	**Mandatory** at 4 and 5-6 and 16 months and 6 years.	2, 4 and 11 months and 6 years.
Haemophilus influenzae type b infection	2, 3, 4 and 12 months.	**Mandatory** at 2, 4 and 5-6 and 16 months.	2, 4 and 11 months.
Hepatitis B	Infants born to hepatitis B infected mothers at birth, four weeks and 12 months old. General population at 2, 3 and 4 months.	**Mandatory**, administered within 24hrs after birth and at 2 and 7 months.	2-7 days after birth and at 2, 4 and 11 months.
Pneumococcal disease	2, 4 and 12 months (PCV) and for adults aged 65+ years (PPV).	**Mandatory** at 2, 4 and 13 months. Recommended but not funded by the National Health system for adults aged 50+ years.	2, 4 and 11 months.
Meningococcal disease	MenB at 2, 4 and 12 months. MenC at 12 months. Men ACWY at 14 years old	Not funded by the National Health system. Recommended at 2-6 months and 7 months to 19 years.	Not included in recommended vaccinations
Measles	12 months and 3 years. Opportunistically offered to unvaccinated or partially vaccinated children aged between 10-16 years.	**Mandatory** at 13 months and 10 years. Catch-up programme offered to unvaccinated or partially vaccinated children aged between 11-19 years.	12 months and 5 years.
Mumps	12 months and 3 years. Opportunistically offered to	**Mandatory** at 13 months and 10 years.	12 months and 5 years.

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	unvaccinated or partially vaccinated children aged between 10-16 years.	Catch-up programme offered to unvaccinated or partially vaccinated children aged between 11-19 years.	
Rubella	12 months and 3 years. Opportunistically offered to unvaccinated or partially vaccinated children aged between 10-16 years.	**Mandatory** at 13 months and 10 years. Catch-up programme offered to unvaccinated or partially vaccinated children aged between 11-19 years.	12 months and 5 years.
Human Papillomavirus infection	Females aged 12-14 years.	Females aged 11-13 years.	Not funded by the National Health system. Recommended for females aged 11-14 years.
Influenza	Children aged 2-8 years. Pregnant women during flu season. Annually for adults aged 65+ years.	Not funded by the National Health system but recommended from 6 months to 18 years and for adults aged 55+ years.	Not funded by the National Health system but recommended for adults aged 65+ years.
Herpes zoster (Shingles)	Adults aged 70+ years.	Not included in recommended vaccinations	Not included in recommended vaccinations

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Table 2: WHO-UNICEF estimates of vaccination coverage (%) in Poland, Romania and the UK in 2017 [15]

	Vaccine												
	BCG	DTP1	DTP3	HepB3	HepB_BD	Hib3	IPV1	MCV1	MCV2	PCV3	Pol3	RCV1	RotaC
Poland	93	99	98	95	93	98	*	96	93	*	92	96	**
Romania	97	93	82	92	93	82	*	86	75	*	82	86	**
UK	*	98	94	*	*	94	*	92	88	92	94	92	90

* No estimate for vaccination coverage

** Vaccination not funded by the Health System

METHODS

Theoretical framework

The Social Ecological Model (SEM) was adopted as a theoretical framework to underpin this study and guide the identification of factors affecting vaccination uptake, and areas for focusing policy and practice recommendations[17]. The SEM acknowledges that health behaviours, such as vaccination uptake, are shaped by multiple factors at the following levels: intrapersonal/individual (e.g. knowledge, attitudes), interpersonal (e.g. family, friends), institutional (e.g. workplaces), community (e.g. neighbourhoods, community groups, local organisations) and policy (e.g. laws, national or local policies)[17]. The SEM has previously been used in the context of vaccination behaviours [18-20]. Using the SEM helped to identify areas in in which to target improvement efforts.

Recruitment and data collection

We conducted in-depth semi-structured interviews with Polish and Romanian CMs and healthcare workers (HCWs) involved in the provision and delivery of vaccinations in areas with high Polish and Romanian populations. Recruitment focused on 3 geographical areas (Boston, Lincolnshire; Slough, Berkshire; Brent, London), with different levels of vaccination coverage and large Eastern European populations [6, 21]. We aimed to interview approximately 20 Polish and 20 Romanian CMs, and 20 healthcare providers. This number of participants was considered achievable, given practical considerations, and adequate to gain insight into the topic.

CMs were identified through community venues (including schools, nurseries and churches), and advertisements in Polish newspapers, Eastern European shops and via Twitter and Facebook pages. Eligible Polish and Romanian CMs included parents and grandparents and men and women

belonging to the target groups for influenza vaccine (pregnant women, adults aged 65+ years and people with specified long term conditions such as diabetes or heart disease). CMs were compensated with a £10 gift voucher. We identified HCWs via general practices and community providers. Potential participants were given an information sheet, fully detailing the study objectives and explaining all aspects of participation, including the right to withdraw from the research.

Participants were interviewed in person or via telephone. CMs were offered the option of being interviewed in English, Polish, or Romanian. Interviews were audio-recorded and reflective notes were taken during interviews. Face-to-face interviews were conducted with CMs in community venues (e.g. libraries and quiet coffee shops) in a location convenient for the participant. Face-to-face interviews with HCWs were performed in workplaces, in quiet environments away from clinical areas. Most interviews with CMs lasted 30-60 minutes, and approximately 20-40 minutes with HCWs.

CMs were asked about their vaccination and related PHC experiences. HCWs were interviewed about vaccination service delivery to Polish and Romanian service users. CMs and HCWs were solicited for service improvement suggestions. Interview topic guides were developed for this study with community involvement.

Public involvement

A Polish community group were involved in the development of study documents, including the topic guides, and were asked to provide feedback on recruitment strategies. This involvement aimed to increase the relevance and usefulness of the study and help to promote study recruitment.

Data analysis

Interviews were transcribed verbatim and analysed thematically using the stages outlined by Braun and Clarke[22]: data familiarisation, coding, and theme identification and refinement. To enhance the rigour of the analysis, coding approaches and data interpretations were discussed between SB, MZ and SMJ.

Interviews were coded using initial codes generated from the interview topic guide and levels of the SEM. Use of the SEM helped to identify where to focus policy and practice recommendations[17].

Research team and reflexivity

This research was led by SB, a postdoctoral researcher at the London School of Hygiene & Tropical Medicine (LSHTM). The researchers had no connection with the research participants prior to

commencing the study. SB had a clinical background, having worked as a nurse in haematology and oncology. The team had academic research (SB, MZ, ME, MR, SMJ) and clinical or public health backgrounds (SB, ME and MR). SB, SMJ and MZ were based at LSHTM at the time of the study, and ME and MR at Public Health England (PHE). SB, ME, MR and SMJ conducted this study as part of the Health Protection Research Unit in Immunisation, a collaboration between LSHTM and PHE.

FINDINGS

Participants

Twenty Polish and 10 Romanian CMs and 20 HCWs were interviewed (Table 3). 3 interviews were conducted in Polish by MZ and the remaining interviews were performed by SB in English (n:27). Detailed CM characteristics are outlined in supplementary table 1. Most CMs were mothers or pregnant women (n:27). In addition, 2 Romanian fathers and 1 Polish woman eligible for the influenza vaccine participated. The average time spent living in the UK was 11 years for Polish CMs and 9 years for Romanian CMs. CMs were recruited via social media (n:22), a Polish newspaper (n:2), a community group (n:1), a children's club (n:1), and through word-of-mouth (n:4). The use of social media meant recruitment was not geographically restricted, most CMs were recruited from London or Lincolnshire.

One HCW was recruited from an area not originally targeted for recruitment (Table 3) because of strong experience in working with EE communities. In addition to NHS HCWs, we also recruited a vaccination advisor (HCW#17) who led an online Romanian vaccination forum organised by medical professionals.

Despite advertising the study extensively, there were challenges in recruiting CMs and recruitment expanded beyond our targeted geographical areas. We had intended to recruit more Romanian CMs, to match the number of Polish participants; however, this was not possible during the time-frame of the study due to challenges with recruitment. The study received some negative responses when advertised via social media on Romanian pages that appeared to reflect a mistrust in taking part in research, anti-vaccination attitudes [23, 24] and concerns around living in England following the Brexit vote [25].

No repeat interviews were performed, and no participants withdrew from the study.

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Table 3: Healthcare worker and community member participants

Healthcare workers		
Region	**No. of interviews conducted**	**Roles of interviewees**
Slough, Berkshire	6	Specialist health visitors, specialist nurses focused on health inequalities and practice nurses
Brent, London	5	Practice nurses
Boston, Lincolnshire	7	School nurses, practice nurses, and a general practice administrator
Hillingdon, London	1	Health visitor
Other	1	Vaccination advisor
Community members		
Community members		**No. of interviews conducted**
Polish participants		20
Romanian participants		10

Factors affecting vaccine uptake, delivery, and PHC access

CMs mostly reported accepting vaccines according to the UK schedule, although the influenza vaccine was more often declined (Table S1). CMs reported struggling with the vaccination decision-making process, which involved the evaluation of perceived potential benefits and risks.

We present factors affecting vaccine uptake and delivery as identified by CMs and HCWs under seven main themes: (i) challenges to navigating the health system, (ii) transnational use of health services, (iii) language and literacy, (iv) expectations of vaccination delivery, (v) vaccine acceptance, (vi) vaccine accessibility, and (vi) trust. These themes span each level of the SEM. Wider barriers to service access were also highlighted in relation to PHC, which has potential implications for vaccination delivery as vaccines are mainly administered in this setting. There were no noticeable differences in the themes that emerged between the interviews conducted in Polish and English.

Challenges to navigating the health system

CMs reported institutional level difficulties in navigating the health system. Several CMs reported challenges in registering with general practices due to uncertainties around entitlement to care and difficulties in producing proof of address as requested by some practices. Interpersonal relationships were a source of support in navigating the health system, with several CMs reporting their involvement in helping Polish and Romanian family members and friends to register with GP practices.

CMs perceived the English PHC system as markedly different to systems in Poland and Romania. CMs explained that in Poland and Romania service users would more often directly access specialist pay-for-services, bypassing general practitioners (GPs). At an intrapersonal level, PHC in England was frequently viewed as a hindering process instituted to restrict access to secondary care and cut costs.

> *'….in Poland a GP is a GP and they accept the fact that they are GPs….so if they cannot deal with something, they will very easily refer you somewhere else…. If you feel dizzy or you've got a headache, they will send you to a neurologist. It's not a problem. Here, trying to get a referral somewhere is just like God help you.' (CM#10 - Polish mother, Cornwall)*

The most critical reports of primary care were made by CMs that had experienced particularly long delays in accessing treatment in England and had quickly accessed treatment on presentation to services in Poland and Romania.

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Transnational use of health services

CMs often reported ongoing use of health services in Poland and Romania, in some instances this was done to avoid relying on PHC in England to gain direct access to secondary care. CM families were also reported to travel to Poland or Romania prior to or in the weeks following the birth of a new-born, to see family and receive healthcare. Some families vaccinated their children during these visits due to the timing of their travel.

Vaccinating children in more than one country could cause disruption the UK immunisation schedule. At an institutional level, HCWs faced challenges in determining which vaccines had been administered to the child, with many returning to England with undocumented vaccination histories. Polish participants also suggested that some families prefer to access certain vaccinations in Poland, an intrapersonal level decision that was influenced by cost, a policy level influence, in some instances.

> *'…. there were some vaccinations we did in Poland because it was cheaper, like chicken pox for [our daughter] …. I think it was £100 here or something like that. I think we paid half in Poland…. we managed to get it when we were on holiday.'*
> *(CM#18 - Polish mother; Lincolnshire)*

Language and literacy

Communication barriers during PHC consultations were reported by both HCWs and CMs. The latter particularly struggled with HCW use of medical terminology and jargon, and the inability of health services to provide information in languages other than English. These factors fall within the institutional level of the SEM. To overcome language barriers several HCWs reported using online translation tools to aide communication. HCWs considered that more 'formal' modes of communication such as telephone or face-to-face interpreting services were difficult to organise, felt impersonal, and created greater uncertainties around messages becoming lost in translation.

Similarly, HCWs struggled to translate vaccination histories. This was a time-consuming process and one, as HCWs suggested, which would be better completed by an alternative service prior to attendance at the practice. Some HCWs reported relying on colleagues with Polish or Romanian language skills, including multi-lingual receptionists, to translate documents. In some instances, practices had developed vaccine "crib sheets", providing the names of vaccinations in Polish and Romanian, to help during consultations.

Most CMs reported that they were not offered, or directed towards, vaccination and broader health information in their native language. CMs and HCWs recommended that vaccination information be made available in different languages, but there was recognition that cost could be a barrier. An additional challenge in working with Roma Romanian communities was overcoming literacy barriers. With those groups, HCWs found that face-to-face verbal communication, involving interpreters, was the best approach.

Expectations of vaccination delivery

Without a prior understanding of vaccination delivery in England, CMs based their expectations on intrapersonal knowledge and experiences in Poland and Romania. This meant their expectations were often unmet because of policy and institutional level differences in vaccination programmes (Table 1), HCW roles and interactions in vaccination appointments.

Comparison of vaccination programmes in the UK, Poland and Romania

Both CMs and HCWs noted that existing variations in vaccines and scheduling between national programmes led to uncertainties. For example, confusion arose for Hepatitis B vaccine, which has been widely available in Europe but was only recently introduced routinely in the UK[26], and BCG vaccination that is not universally offered in the UK[27]. Polish parents reported unease at not receiving the BCG vaccination for their children, as Poland is not classed by Public Health England as having a high TB prevalence[28].

The number of childhood vaccinations administered within a short space of time was also reported as a concern by parents. Some CMs argued that in Poland and Romania some vaccines could be available with a choice of formulations, such as measles, mumps and rubella either freely as three separate jabs or for a fee in one jab, while the NHS only administered the combined 3-dose MMR vaccine. Similarly, choice was also provided in Poland and Romania between vaccine brands, albeit at a cost when administered by private providers. Branded vaccinations were reportedly portrayed as better.

> *'...the GP [In Romania] told us, "just use this one." I think [the GP] might have told us, "If you want," you know, "I can give you this standard free of charge one. If you want your real one, you just go to the pharmacy, buy it, bring it, we'll do it, off you go." (CM#4 – Romanian father, Maidenhead)*

Difference in consent for vaccines in schools was highlighted between England and Romania by one HCW. It was reported that providing written consent in England could be off-putting to parents not used to this particularly formalised approach, which made vaccinations appear riskier.

Vaccine administration

Polish participants discussed that in Poland vaccines are administered by doctors, while in England this role is performed by nurses. Some Polish participants were concerned that nurses in England might not be qualified for this role. Polish mothers also highlighted concerns that children were not given a physical examination before vaccine administration. Instead, it was reported that the onus on whether vaccinations should be given was placed on the parent, who was asked whether their child was healthy.

> *'I do not like it, for example, that children are not tested (checked) before vaccination. [The decision to give the vaccination] depends on the parent's opinion whether the child is healthy or not, but it is sometimes difficult to really judge whether a child is healthy, if he or she goes with a cold, or I do not know, with something.' (CM#12 – Polish mother, Wellingborough)*

One Polish parent also reported that children attending vaccination services in Poland would wait in a separate area to symptomatic patients. The absence of segregated areas between healthy and sick patients in GP practices in England was found to be alarming.

Vaccine acceptance

Although most CMs regarded vaccines as essential for protection against disease, certain vaccines created greater concern or were considered less important than others. Several participants voiced higher apprehension around 'newer' vaccines that were considered not to have been in use for enough time to be considered safe. Both MMR and the influenza vaccines were either considered unimportant or generated particular concerns. The hesitancy related to MMR was linked to the Wakefield controversy [29], but was reported not to be at any greater level than in the general population. Influenza was the dominant vaccine that CMs reported refusing (Table S1). Refusals were mainly based on the perception that this vaccine is unnecessary or not as important as other vaccines. Influenza was considered less serious compared to other vaccine-preventable diseases.

It did not appear that messages surrounding the larger societal benefits of influenza vaccination had been received. Several CMs also reported concerns that having the influenza vaccine could cause flu-like side effects.

Accessibility of vaccines

Appointment booking and appointment length

CMs reported that it was straightforward and easy to book vaccination appointments at GP practices; however, dissatisfaction was often noted around the time allocated. Similarly, HCWs considered it generally difficult to provide vaccine information, administer vaccines and document vaccine delivery within the time allotted (approximately 10-15 minutes), and this was made even more challenging because of communication barriers.

The time-restriction on appointments made some CMs feel rushed and not listened to, potentially leaving them with questions and vaccine concerns that were not addressed. Interviewees reported that this could generate tensions.

Vaccination reminders

Although vaccination acceptance was high, HCW reported that attendance dwindled for EE children after vaccinations at eight and twelve weeks.

CMs reported not always receiving vaccination reminders. There was a lack of consistency in the approaches used by practices in delivering vaccination recalls and the onus appeared to be primarily on the parents to book and remember appointments. Given the frequent travel of Polish and Romanian families to their home countries, appointments were easily missed.

Trust

'Social' trust in institutions and 'interpersonal' trust in individuals, terms used by Mechanic and Schlesinger [30], can be applied to underpin confidence in vaccines, vaccine delivery and health services. CMs discussed trust in relation to health authorities, the pharmaceutical industry, and HCWs. Trust in health care was partially shaped by different expectations of health services and a lack of understanding of how the English PHC system works. Some CMs were particularly sceptical about the quality of healthcare in England:

> *'I have more confidence in the doctor in Poland. Doctors in Poland are trained doctors. They study medicine for several years….Here, I have the impression that a doctor….they have everything on the computer. He's typing in a computer that you come, have a cold, a fever, and [it] jumps out [from the computer], what he has to give me.' (CM#12 – Polish mother, Wellingborough)*

Lack of trust in PHC was a driving factor for people opting to access emergency services in England and for seeking care in Poland and Romania or private Polish doctors in England.

To promote trust in health services it was considered crucial for HCWs to explain the system to service users. With some communities, HCWs reported that engagement was more effective using out-reach strategies (e.g. door-knocking, approaching community groups) rather than trying to encourage health service attendance.

To develop trust in vaccines, it was considered important for CMs to be able to access credible information . CMs reported challenges in accessing and sourcing trustworthy vaccination information, amidst a barrage of well-written unregulated sources that appear using Google searches, through parent forums, and on social media. These fall within the SEM as community level influences. Although, as noted some CMs were not confident in HCWs, most CMs trusted HCWs advice on vaccines and the literature sources produced by the NHS on vaccinations, influences at an institutional level, which was considered more credible than other sources.

DISCUSSION

We found that vaccination attitudes and behaviours amongst CMs were influenced by multiple interconnected factors. These included language barriers, perceptions about vaccine safety and importance, and expectations around vaccination services and PHC.

Overall, the reported influence of language barriers, population transiency, negative perceptions of healthcare professionals, poor understanding of healthcare entitlements, work-life demands and lack of integration on PHC experience were consistent with the literature[31-39]. Previous research also highlights that migrants may prefer to access health services in their country of origin due to negative perceptions of the English PHC system[35] and greater confidence familiarity and confidence in their country of origin's doctors [37, 40].

We found that vaccination and healthcare experiences in Poland and Romania shaped expectations of services in England. Differences in service provision in England, such as vaccine delivery by nurses, were met with uncertainty and anxiety. The variations in vaccination schedules across countries which caused concern among our participants, are likely to affect migrant populations in other countries.

Influenza vaccination was commonly refused due to perceptions around its importance and efficacy. It is not clear whether influenza vaccination refusal is more prominent amongst Polish and Romanian

communities. This warrants further exploration, particularly as confidence in vaccines has been decreasing in many European countries, most notably in Poland[16].

We have identified key recommendations intended to improve vaccination and health service access by Polish and Romanian communities (Table 4), many of which would be transferable to other European countries where these communities have also settled. While some of these recommendations incur additional staff time and costs, they should be placed in the broader context of ensuring high uptake and reducing the likelihood of disease outbreaks in these communities.

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Table 4: Key recommendations linked to study findings and levels of the Social Ecological Model

Theme	Sub-theme	Level of Social Ecological Model	Key Recommendations
Navigating the health system	-	Intrapersonal, Interpersonal Institutional	• HCWs to explain how the health system works in England[41]and clarify expectations, notably for new migrants who register at general practices. • Out-reach vaccination approaches for those that do not access health care.
Transnational use of health services	-	Intrapersonal, Interpersonal	• Discuss future travel to avoid missing or delaying vaccines [42] • HCWs to ask new residents about their vaccine history and record it and offer vaccinations to people unable to provide evidence of vaccination [4, 42-44].
Language and literacy	-	Intrapersonal Institutional	• Vaccination and broader health literature made available in translated forms[4]. • Information provided using pictograms or pictures to help overcome literacy barriers. • Out-reach vaccination approaches, involving an interpreter, to reach groups that face language and literacy barriers. • Improved access to interpreting and translation services[4]
Expectations of vaccination delivery	Comparison of vaccination programmes	Intrapersonal: Interpersonal, Institutional, Community,	• Differences in vaccination schedules and consent to be highlighted and discussed by HCWs. • HCWs to encourage open communication around vaccines and vaccination delivery, particularly with those that are unfamiliar with the English health system. • Views and expectations of all service users should be used to shape services.
	Consent		
	Administration of vaccine		
Acceptance of vaccines	Perceived safety of MMR	Intra-personal, Inter-personal, Community	
	Importance of influenza (flu) vaccine		
Accessibility of vaccines	Appointment booking and length	Institutional,	• Longer appointment slots when there are language barriers.
	Vaccination reminders	Institutional	• Vaccination reminders given during health visitor appointments and general practice visits. • Vaccination reminders in Polish and Romanian.

Trust	Trust in healthcare workers	Institutional	• HCWs and CMs to discuss service expectations and acknowledge differences in systems. • Direction to credible vaccination sources. • Encourage discussion around vaccine concerns.
	Trust in vaccinations and pharmaceutical industry	Institutional	

CONCLUSION

Overall, CMs reported accepting vaccination; however, several barriers to uptake were identified. These included difficulties in navigating and trusting the English health system, language barriers and challenges in accessing credible vaccine information in translated forms. Concerns around vaccine importance and efficacy were raised by CMs for influenza vaccine, which led to lower acceptance.

HCWs reported difficulties in translating and understanding vaccination histories, ensuring vaccination schedule completeness amongst families frequently traveling between England and Poland or Romania, and overcoming verbal communication barriers.

In a context where external and internal migration has been growing in England and across Europe, and several measles outbreaks have occurred over the past few years, it is important that HCWs promote an open dialogue with service users to discuss vaccination and health service expectations. Crucially, providers are recommended to routinely obtain and record vaccination histories, explain differences in vaccination delivery and scheduling, and consider vaccine schedule travel disruptions.

FIGURE LEGENDS

Figure 1. Estimated number of EU8 and EU2 born residents in the UK, 2004 to 2017. Data extracted from the Office for National Statistics [6]. Data for each year is from January-December.

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FOOTNOTES

Abbreviations

CM, community member; HCW, healthcare worker; EU, European Union; EE, Eastern European; GP, general practitioner; UK, United Kingdom

Contributors

The study was designed by SB, ME and SMJ. SB was responsible for data collection and analysis. SB and MZ conducted the interviews. SB, MZ and SMJ were involved in data analysis. SB, MZ, ME and SMJ were involved in the interpretation of findings. SB produced the first draft of the manuscript. SB, ME, MR, MZ and SMJ contributed to revisions of the manuscript and gave final approval for the study to be published.

Acknowledgements

We would like to thank the research participants and members of the public involvement group. We thank Vanessa Saliba for providing helpful feedback and sharing her expertise during the project.

Funding

The research was funded by the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Immunisation at the London School of Hygiene & Tropical Medicine in partnership with Public Health England (PHE). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR, the Department of Health or Public Health England.

Ethical approval

The study received ethical approval from the London School of Hygiene and Tropical Medicine Observational Research Ethics Committee (Ref: 12124), the Health Research Authority (Project ID: 224734), and from Research and Development departments in the recruitment areas. Written informed consent was obtained from all study participants.

Data sharing statement

No additional data are available

Competing interests

We have non conflicts of interest to declare.

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Figure 1

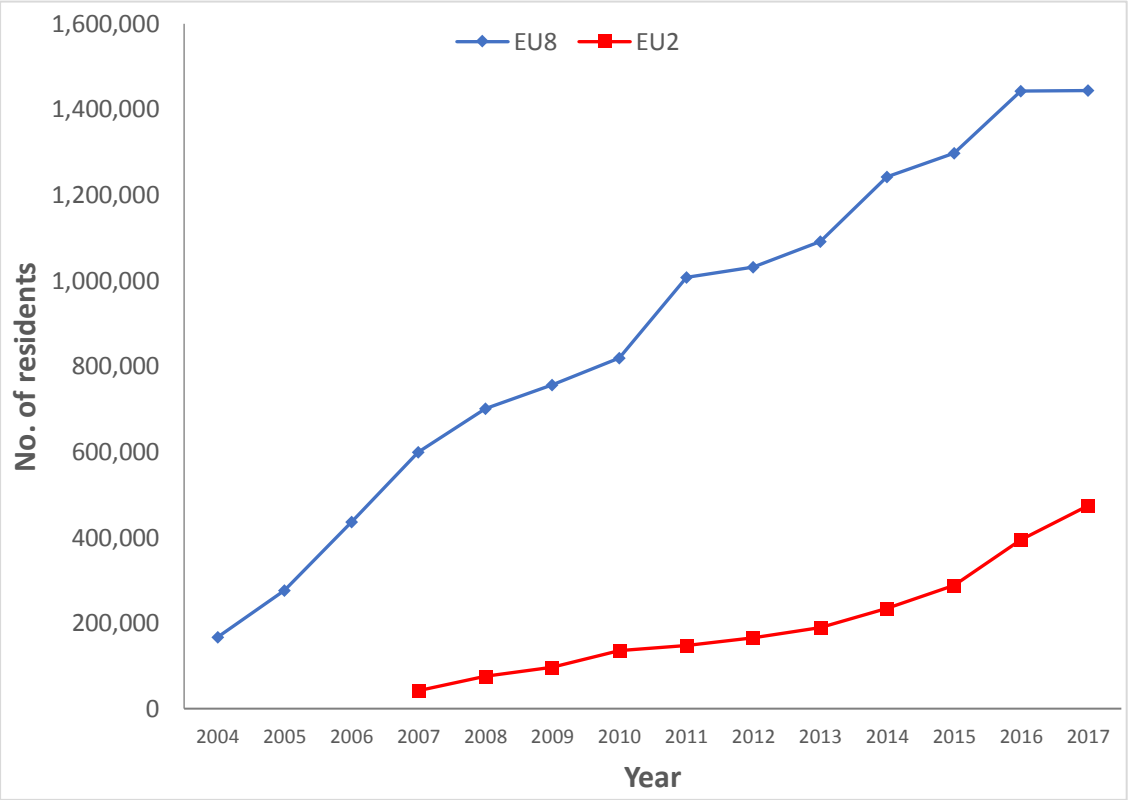

***Figure 1**. Estimated number of EU8 and EU2 born residents in the UK, 2004 to 2017. Data extracted from the Office for National Statistics [6]. Data for each year is from January-December.*

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Supplementary table 1: Polish and Romanian participants

Participant No.	Current area of residence	Gender	Years in England	Children	Reported vaccination refusals and vaccinations outside of England
Polish participants					
1	Greater London	Female	10	2.5-year-old daughter	Child fully vaccinated in England
2	Lincolnshire	Female	11	5-year-old daughter	Child fully vaccinated in England
3	Greater London	Female	10	3.5-year-old son	Child fully vaccinated. Child was born in Poland and received some early vaccinations there (first year).
5	Greater London	Female	12	34 weeks pregnant. 5-year-old son	Child fully vaccinated aside from influenza vaccination declined.
6	East Sussex	Female	9	7-year-old and 1-year old daughter	Child fully vaccinated in England.
7	Greater London	Female	12	Four sons aged 12, 5 and 3 years	Children fully vaccinated. Eldest son received some vaccinations in Poland.
8	County Durham	Male	12	Wife 37 weeks pregnant at the time of the interview (participant 9)	As someone with asthma, this participant reports receiving the influenza vaccine in England. Reports that he has no concerns about his child being vaccinated in the future.
9	County Durham	Female	12	37 weeks pregnant	Received all recommended vaccinations during pregnancy.
10	Cornwall	Female	14	10-year-old son	Child fully vaccinated in England. Participant also has influenza vaccinations annually.
11	Cornwall	Female	10	7-year-old daughter	Child fully vaccinated in England
12	Northamptonshire	Female	12	16-year-old son, 2-year-old daughter	Children fully vaccinated in England. Son had most vaccinations in Poland. Participant remembers refusing the pertussis vaccine during pregnancy.
13	Cornwall	Female	11	7-year-old son	Son received some vaccinations in England and Poland (living in Poland until the age of 4 years). Family have all received the flu vaccination as her son has Leukaemia.
14	Greater London	Female	10	8-year-old son	Child fully vaccinated aside from influenza vaccination declined
15	Lincolnshire	Female	12	4 children aged 25, 22 and twins aged 15 years	Children fully vaccinated in Poland and England.
17	Lincolnshire	Female	13	12-year-old son	Declined flu vaccination for herself. Child fully vaccinated aside from influenza vaccination declined.
18	Lincolnshire	Female	11	1 daughter aged 5 yrs. Pregnant at the time of interview.	Daughter received some vaccinations in Poland and England. Declined flu vaccination during pregnancy and for her daughter.
19	Lincolnshire	Female	12	2 children.	Children fully vaccinated in England.
20	Greater London	Female	12	5-month-old son	Received all recommended vaccinations during pregnancy and for child.
22	Greater London	Female	10	6-year-old daughter	Declined flu vaccination for herself and daughter. Received all other recommended vaccinations. Also accessed chickenpox vaccination for daughter.
23	Norfolk	Female	13	4-month-old daughter	Declined flu vaccination during pregnancy. Child fully vaccinated in England.
Romanian participants					
4	Berkshire	Male	9.5	10.5-year-old son	Child fully vaccinated. Child born in Romania and received some early vaccinations there.
16	Greater London	Male	3.5	4-month-old son	Child fully vaccinated in England.
21	Greater London	Female	11	10-year-old daughter, 3.5-year-old son	Children fully vaccinated in England.
24	Wiltshire	Female	3	2-year-old daughter	Received all recommended vaccinations during pregnancy and for her daughter
25	Greater London	Female	5	20-month-old son	Child fully vaccinated. Declined flu vaccination during pregnancy.
26	Hampshire	Female	10	13-month-old son	Child fully vaccinated. Declined flu vaccination during pregnancy.
27	Greater London	Female	8	13-month-old daughter.	Received all recommended vaccinations during pregnancy and for child.
28	Greater London	Female	11	2- year old son	Received all recommended vaccinations during pregnancy and for child.
29	Greater London	Female	18	15-month-old daughter.	As someone with asthma, reports receiving the influenza vaccine in England. Child fully vaccinated.
30	Coventry	Female	10	No children.	As someone with asthma, reports receiving the influenza vaccine in England. She also reports that her mother, in her 60s, also receives the influenza and the pneumococcal vaccine in England.

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	8
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	7- details for SE
Occupation	3	What was their occupation at the time of the study?	7
Gender	4	Was the researcher male or female?	~~Title page~~
Experience and training	5	What experience or training did the researcher have?	7
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	7
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	7
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	7
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	6-7
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	6
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	6
Sample size	12	How many participants were in the study?	7
Non-participation	13	How many people refused to participate or dropped out? Reasons?	7 - no participa
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	6
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	6 - just researc
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	7-8 and Supple
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	6
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	7
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	6
Field notes	20	Were field notes made during and/or after the inter view or focus group?	6
Duration	21	What was the duration of the inter views or focus group?	6
Data saturation	22	Was data saturation discussed?	No
Transcripts returned	23	Were transcripts returned to participants for comment and/or	No

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	7
Description of the coding tree	25	Did authors provide a description of the coding tree?	7
Derivation of themes	26	Were themes identified in advance or derived from the data?	7
Software	27	What software, if applicable, was used to manage the data?	7
Participant checking	28	Did participants provide feedback on the findings?	No
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	9-13
Data and findings consistent	30	Was there consistency between the data presented and the findings?	9-13
Clarity of major themes	31	Were major themes clearly presented in the findings?	9-13
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Yes e.g. P11

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.