

Vaccine Uptake in the Irish Travelling Community: An audit of general practice records

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Abstract

Background Compared to the general population, the Traveller community has substantial health inequalities. Vaccination coverage in Traveller children is estimated to be low and Travellers are at higher risk of vaccine-preventable diseases due to their social circumstances.

Methods Audit of vaccination history of Traveller ($n=214$) and non-Traveller ($n=776$) children registered at a General Practice in England. The Green Book childhood immunisation schedule was used as a reference standard.

Results There was significantly lower coverage for Traveller children compared to non-Traveller children for all vaccinations in the routine childhood immunisation schedule. The percentage of children completing the schedule at all time points was significantly lower in the Traveller community.

Conclusions Traveller communities have significantly lower uptake of vaccinations and therefore Travellers' children should be targeted by GPs for catch-up vaccination to improve outcomes for individuals and local herd immunity.

Introduction

There are substantial health inequalities between the Traveller and non-Traveller population¹ with the life expectancy of Travellers being 10-12 years lower than non-Traveller equivalents.² Several studies have shown that there is lower vaccine uptake in Traveller children but there is a lack of recent, accurate data in the UK.³⁻⁵ There have been several reports of measles outbreaks originating in the Traveller community.^{6,7} Therefore, this community is at risk of vaccine-preventable diseases and additionally these outbreaks have spread to the non-Traveller community.^{8,9} Ireland, Scotland and Wales and pockets of England are implementing strategies to improve vaccination coverage in the general population, but there is no national strategy in place in England to target Traveller, Gypsy and Roma communities.

The 2011 census recorded 57,680 Gypsies and Irish Travellers in England and Wales.¹⁰ However, it is thought that the true number is more likely to be in the region of 150,000 to 300,000 as many Travellers do not identify their ethnicity due to fear of discrimination.¹ In 2006 it was estimated that 11% of the Traveller population lived in the East of England forming one of the largest ethnic minorities in this region.¹¹

The aim of this audit study was to compare vaccination uptake in Traveller and non-Traveller children and use this information to justify the implementation of a catch-up vaccination programme, depending upon the results.

Methods

Data was extracted from the Primary Care electronic health records at a GP Practice in the East of England where a large proportion of patients are Irish Travellers. Database extraction took place in May 2015.

Children were identified by running a report in SystmOne with the criteria "Between the age of 0 and 17". Travellers were identified initially by a separate report searching by "postcode begins with", using the known location of permanent local Traveller sites. Where postcodes were absent or incorrect, additional children known by the healthcare team to be from Traveller families were manually identified.

Immunisation status was compared to the current Green Book childhood immunisation schedule.¹² As a number of changes have been made in recent years, these were reflected in the recording such that children born prior to the introduction of the 12 month booster for Meningitis C and Hib vaccines were recorded as having been vaccinated if they had all the doses recommended at the

time. The number of children eligible for pneumococcal vaccine was taken to be any child born from 05/09/2004 onwards as the vaccine was introduced in September 2006 along with a catch-up programme for children aged 2-24 months (date of birth: 05/09/2004 to 03/07/2006). Rotavirus vaccine was introduced in April 2013 so the number eligible was taken to be any child born from May 2013 onwards. Meningitis C teenage booster was introduced in September 2013 to be given in schools to children in year 10. Eligible children were therefore those from the current year 10 (born prior to September 2000) onwards.

Vaccinations were recorded on an individual tab in SystemOne and this was used to record the vaccination history of all children. Vaccines were recorded as “yes” if the correct vaccination in the correct time period was present in the medical record. Vaccines were recorded as “no” if there was no medical record or if there was a documented refusal of the vaccine. As many of the travellers were not born in the area, tracing vaccination status prior to their registration at the practice was difficult. Those with uncertain vaccination histories were recorded as “no” in line with the Green Book recommendations that any individual with an uncertain vaccination history is treated as unimmunised.¹³

After the initial download, data was anonymised and was not viewed by anyone outside of the healthcare team.

Ethical Approval

As this was an audit of routinely collected clinical data, ethical approval was not sought.

Results

A total of 1002 children (25% of total patients) were registered at the practice. Of these children, 214 were identified as members of Irish Traveller families and 776 were non-Travellers. 12 children were English Travellers living in a separate location and with a different lifestyle to the Irish Travellers and so were excluded from statistical analysis (although they will still be contacted for catch-up vaccination if necessary).

Schedule Completion

Table 1 shows a comparison of vaccination schedule completion between Traveller and non-Traveller children and overall herd immunity. Coverage was more than 40% lower in Traveller children compared to non-traveller children for completion of the vaccination schedule at all time points across the immunisation programme.

Individual Vaccinations

Table 2 shows the percentage of eligible Traveller, non-Traveller and total children completing the course of an individual vaccine. Coverage was over 30% lower for each individual vaccine in Traveller children compared to non-Traveller children.

Figure 1 shows the cumulative percentage of Traveller and non-traveller children completing the primary tetanus, diphtheria, polio and pertussis course at 12-monthly increments in age from 12 months to 18 years.

Children past their 14th birthday are eligible to have completed the entire childhood immunisation schedule. Figure 2 depicts the proportion of these children who have received all the recommended vaccinations up to four given time points; complete baby vaccines (vaccines up to and including 4 months), complete to 12 months, complete to pre-school (before age 5) and fully complete to include the teenage vaccines. 'Fully complete' excludes HPV and the teenage booster for Men C as these were introduced quite recently. Pneumococcal coverage is also not used in these figures since it was only introduced in 2006, when these children were all 5 years or older.

It can be seen that completion of the immunisation schedule in Traveller infants is substantially below that of non-Traveller infants. This trend widens over time as the children progress into their teen years.

Discussion

Main finding of this study

Vaccine coverage and completion of the vaccination schedule in children from this Traveller community is substantially lower when compared to coverage in non-Traveller children across the whole immunisation programme in effect at the time.

The World Health Organization (WHO) recommends 90% national coverage for every vaccine and at least 80% coverage in each district or equivalent administrative unit.¹⁴ Additionally, WHO recommends that for measles elimination, over 95% coverage for both vaccines is needed in every district.¹⁵ Low coverage in the Traveller community leads to a dilution in total coverage, which, from this data, falls far below that recommended by WHO. Herd immunity is therefore reduced and outbreaks of vaccine-preventable diseases are more likely to occur. In recent years there have been cases of both measles and meningitis in this local Traveller community. Given that this data is from a single GP practice, it would not be classed as a district by WHO standards. However, this GP practice

has a proactive and positive relationship with the large local traveller community, which may account for the improved coverage when compared with other studies.³⁻⁵

Rotavirus vaccine coverage is significantly lower in the Traveller community, with less than 50% taking up the vaccine (Table 2). This vaccine would be particularly beneficial to Travellers as it protects against forms of gastroenteritis which children living on Traveller sites are more at risk of due to poor sanitation and hygiene.¹⁶ The rotavirus vaccine was introduced recently (April 2013) and may be a useful marker of the Travellers' current beliefs and attitudes towards vaccination. There is clearly much work needed to improve uptake by promoting understanding and appreciation of the long-term benefits of vaccination. Due to low levels of literacy within the Traveller community¹⁷, information often spreads by word-of-mouth, potentially leading to a rapid change in vaccine uptake if one person in the community hears something good or bad about vaccination from, for example, another Traveller site.

Figure 1 shows that timeliness of vaccination of the primary course of tetanus, diphtheria, polio and pertussis is reduced in the Traveller children. Overall, completion rates are higher in non-Traveller children. However, in both groups, cumulative percentage vaccinated is lower in the older children, suggesting that more of the teenagers did not complete the primary course than the younger children. This indicates that vaccination coverage may be improving. Nevertheless, the reduced cumulative percentage between the under 24 and 48 month Traveller children remains a concern.

Figure 2 shows that for children past their 14th birthday (and therefore eligible to have completed the childhood immunisation schedule), the difference in vaccine uptake widens with age. For both Traveller and non-Traveller children, the percentage up-to-date on vaccines decreases with increasing age, showing that uptake for infant vaccines is highest and for teenage vaccines is lowest. However, the percentage 'fully complete' should be treated with some caution. Although all children past their 14th birthday could potentially have completed the immunisation schedule, certain individual factors may have prevented this. For example, the fifth tetanus dose can be given from the age of 13 yet it must be given ten years after the fourth dose. Therefore if a child had the fourth dose aged 5 or older, then the time of fifth vaccination will be delayed, meaning that they will not have completed the childhood immunisation schedule by their 14th birthday.

What is already known on this topic

A recent study estimated the uptake of the third dose of polio and first dose of MMR within the Traveller population nationwide.⁴ These were used as markers to indicate coverage of the overall immunisation schedule. However, only 22 (16%) of the 135 Primary Care Trusts were able to provide

an estimate of vaccine coverage in the Traveller community and of these, the majority estimated MMR coverage to be below 70%. Although it is acknowledged that immunisation rates are lower within Traveller communities, exactly how much lower they are remains unclear.

What this study adds

It is difficult to assess Traveller vaccine uptake accurately. This data was captured from a general practice where a large proportion of Travellers are registered and which adopts a proactive approach to engage with and provide health care to this community. Therefore this audit study has the potential to provide more accurate data for coverage of individual vaccines and percentage rates of schedule completion than previous studies.

Our results compare favourably to those of the 1993 study in East London³ in that a higher percentage of children have completed both the primary tetanus course and the MMR course. This could either be because awareness of the benefits of vaccination has increased in the general population in the last two decades, or it could suggest that immunisation rates are higher in communities which are actively targeted by health professionals, or a combination of the two factors, but further research is required to elucidate this. In the 1993 study, the recording of immunisation status was based on opportunistic presentation to a GP or to A&E, using parental report or records if available, and may not reflect the case of children who had regular contact with healthcare professionals trusted by the community.

Our verifiable data still shows a markedly reduced vaccine uptake within a Traveller community that has regular contact with a trusted practice, many of whom return to the area specifically to see the GP that they trust. It is likely that vaccine uptake within groups who do not have a “trusted” general practice is even lower.

Limitations of this study

There were some limitations to this audit which were unavoidable due to the lifestyle of Travellers. Though 214 Traveller children were identified from practice records, it is likely that there are fewer children than this living at the local permanent site at any particular time due to the nature of their travelling lifestyle. Additionally, not all children living on the site will have been registered at the practice and those who are unregistered are less likely to be fully vaccinated. However, due to the concerted efforts of the practice staff and engagement with this particular Traveller community, the number of unregistered children is likely to be small.

In some cases it was difficult to confirm vaccination status. For example, in teenagers with uncertain vaccination history, unless there was proof that a vaccination has been given, such as the nurse being shown the child's red book, then the accuracy of the information entered into the medical records cannot be guaranteed. In some cases, the teenage tetanus vaccine had been mis-recorded as the 2 month vaccination, as it was the first tetanus vaccine the child had received at the practice. However, given no proof of prior vaccination the child should be treated as unimmunised and the schedule for uncertain immunisation history should be followed. In addition, if the vaccination schedule for incomplete immunisation status has not been followed and the child is just given the vaccine for their age, for example the Td/IPV vaccine for the teenage tetanus booster, then this may be interpreted to mean that the child is fully immunised when in fact, having had only one dose, they will not have full protection from the diseases.

Conclusions

This audit has highlighted a large difference in immunisation status between the Traveller and non-Traveller children registered at a single practice and this difference has an impact on herd immunity. It is documented that many GPs have refused healthcare to Travellers¹⁸ whereas this particular practice engages with the local Traveller community, actively working with the Traveller Lead Nurse and the Traveller Community Development Worker appointed by the County Council. Despite these efforts, this audit has revealed that there is a need for discussion of the reasons for non-vaccination with Traveller parents in order to understand the low coverage in this community. With these reasons in mind, the aim would be to implement catch-up vaccination for the children who are currently behind in the childhood immunisation schedule and to encourage greater uptake of full-course vaccination from the outset amongst the parents of young children in the Traveller population.

If the active engagement of healthcare professionals with this local Traveller group has affected vaccination coverage, then these vaccination statistics are likely to be higher than in demographically comparable locations where general practices do not actively collaborate with Traveller patients, and resulting herd immunity is likely to be even lower in these areas. In line with the recommendations of both NICE¹⁹ and WHO¹⁴, immunisation should be targeted in areas where there is a lower coverage than the national average, such as communities with a significant Traveller population.

Both the education of Traveller communities in terms of the benefits of vaccination, and education of healthcare professionals in terms of duty of care to this community may be needed to improve

vaccination uptake. The UNITING protocol is the first large-scale attempt to understand the reasons behind uptake of immunisations from both health care workers and Travellers, and hopes to be the first step in addressing the problem of low vaccine coverage in Traveller communities.²⁰

Our audit study has shown that there are inherent problems reliably identifying Traveller patients and their immunisation status, making the monitoring of Traveller health on a wider scale problematic. The “Gypsy or Irish Traveller” subcategory was introduced in the 2011 Census. Despite the fact that the NHS is mandated to base ethnic monitoring on the ONS Census²¹, Travellers, Gypsies and Roma are not currently ethnic groups that are monitored by the NHS. Our findings strengthen the case for their inclusion.

Author’s contributions: KCD contributed to the conception of the study, data extraction and analysis, interpretation of the results and writing of the manuscript. RM: methodological guidance, analysis and presentation of the data, interpretation of the results and writing of the manuscript. TB: provided clinical oversight, contributed to the conception of the study, data extraction, interpretation of the results and writing of the manuscript.

References

1. Lane P, Spencer S, Jones A. *Gypsy, Traveller and Roma: Experts by Experience*. Cambridge: Anglia Ruskin University, 2014.
http://ww2.anglia.ac.uk/ruskin/en/home/news/roma_report.Maincontent.0007.file.tmp/Experts%20by%20Experience.pdf (28 October 2015, date last accessed).
2. Barry J, Herity B, Solan J. The Health Research Board. *The Travellers’ Health Status Study: Vital Statistics of Travelling People, 1987*. Dublin: The Health Research Board, 1989.
<http://www.lenus.ie/hse/bitstream/10147/45446/1/7846.pdf> (28 October 2015, date last accessed).
3. Feder GS, Vaclavik T, Streetly A. Traveller Gypsies and childhood immunization: a study in east London. *Br J Gen Pract* 1993;43:281–4.
4. Dar O, Gobin M, Hogarth S, Lane C, Ramsay M. Mapping the Gypsy Traveller community in England: what we know about their health service provision and childhood immunization uptake. *J Public Health* 2013;35(3):404–12.

5. Kraigher A, Vidovic M, Kustec T, Skaza A. Vaccination coverage in hard to reach Roma children in Slovenia. *Coll Antropol* 2006;30(4):789–94.
6. Maduma-Butshe A, McCarthy N. The burden and impact of measles among the Gypsy-Traveller communities, Thames Valley, 2006-09. *J Public Health* 2013;35(1):27–31.
7. Cohuet S, Bukasa A, Heathcock R *et al*. A measles outbreak in the Irish traveller ethnic group after attending a funeral in England, March–June 2007. *Epidemiol Infect* 2009;137(12):1759–65.
8. Muscat M. Who gets measles in Europe? *J Infect Dis* 2011;204:S353-65
9. Gee S, Cotter S, O’Flanagan D; National Incident Management Team. Spotlight on measles 2010: Measles outbreak in Ireland 2009-2010. *Euro Surveill.* 2010;15(9):pii=19500.
10. Office for National Statistics. *2011 Census: KS201UK Ethnic group, local authorities in the United Kingdom*. London: Office for National Statistics, 2013.
<http://www.ons.gov.uk/ons/search/index.html?newquery=ks201ew> (21 May 2015, date last accessed).
11. Home R, Greenfields M; Cambridgeshire County Council. *Cambridge sub-region traveller needs assessment*. Cambridge: Cambridgeshire County Council, 2006.
<https://www.cambridge.gov.uk/sites/default/files/documents/gypsy-and-traveller-accommodation-needs-assessment-2006.pdf> (28 October 2015, date last accessed).
12. Public Health England. *The Green Book (Chapter 11)*. London: Public Health England, 2014.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/400554/2902222_Green_Book_Chapter_11_v2_4.pdf. (28 October 2015, date last accessed).
13. Public Health England. *Vaccination of individuals with uncertain or incomplete immunisation status*. London: Public Health England, 2014.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/463433/HPA-algorithm-September-2015-04b.pdf (28 October 2015, date last accessed).
14. WHO. *Global Vaccine Action Plan 2011-2020*. Geneva: World Health Organization, 2013.
http://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en/ (28 October 2015, date last accessed).

15. WHO. *Measles vaccines: WHO position paper*. Weekly epidemiological record. Geneva: World Health Organization, 2009;84(35):349-360.
<http://www.who.int/wer/2009/wer8435.pdf?ua=1> (28 October 2015, date last accessed).
16. WHO. *International travel and health*. ISBN: 978-92-4-158045-8. Geneva: World Health Organization, 2012. (Chapter 6: Vaccine preventable diseases and vaccines).
http://www.who.int/ith/ITH_chapter_6.pdf (28 October 2015, date last accessed).
17. Greenfields M, Home R, Loveridge J, McWilliam N, O'Hara R. *Dorset Gypsy Traveller Accommodation Assessment*. Chelmsford: Anglia Ruskin University, 2007.
http://www.southwest-ra.gov.uk/media/SWRA/RSSDocuments/Gypsies_and_Travellers/Dorset_Acomm_Needs_Assess.pdf (28 October 2015, date last accessed).
18. Cemlyn S, Greenfields M, Burnett S, Matthews Z, Whitwell C. *Inequalities experienced by Gypsy and Traveller Communities: A review*. (Research report: 12). London: Equality and Human Rights Commission, 2009.
http://www.equalityhumanrights.com/sites/default/files/documents/research/12inequalities_experienced_by_gypsy_and_traveller_communities_a_review.pdf (28 October 2015, date last accessed).
19. NICE. *Reducing differences in the uptake of immunisations*. London: National Institute for Health and Care Excellence, 2009.
<https://www.nice.org.uk/guidance/ph21/documents/reducing-differences-in-the-uptake-of-immunisations-final-scope2> (28 October 2015, date last accessed).
20. Jackson C, Bedford H, Condon L *et al*. UNderstanding uptake of Immunisations in Travelling aNd Gypsy communities (UNITING): protocol for an exploratory, qualitative study. *BMJ Open* 2015;5(6):e008564.
21. Equality and Health Inequalities Team; NHS England. *Monitoring Equality and Health Inequalities: A position paper*. Leeds: NHS England, 2015. <https://www.england.nhs.uk/wp-content/uploads/2015/03/monitrg-ehi-pos-paper.pdf> (17th November 2015, date last accessed).

Table 1: Percentage of eligible children completing the schedule to a particular time point

Vaccine	Percent Coverage (n=number eligible)		
	Traveller	Non-Traveller	Total
T/D/Po/Pe: Primary Course	53.1 (n=211)	94.0 (n=771)	85.2 (n=982)
T/D/Po/Pe: Full Course (5 doses)	10.9 (n=46)	62.9 (n=159)	51.2 (n=205)
>12 months completion	41.5 (n=200)	89.7 (n=749)	79.6 (n=949)
>5 years completion	33.1 (n=166)	85.0 (n=574)	73.4 (n=740)
>14 years completion	6.5 (n=46)	57.2 (n=159)	45.9 (n=205)
MMR completion (>5years)	45.2 (n=166)	90.8 (n=574)	80.5 (n=740)

n=number eligible for the vaccine

MMR = Measles/Mumps/Rubella

T/D/Po/Pe = Tetanus, diphtheria, polio, pertussis

Table 2: Coverage (%) for each vaccine in order of the childhood immunisation schedule

Vaccine	Percent Coverage (n=number eligible)		
	Traveller	Non-Traveller	Total
Rotavirus	47.6 (n=21)	92.2 (n=64)	81.2 (n=85)
T/D/Po/Pe (2 months)	63.1 (n=214)	95.7 (n=775)	88.7 (n=989)
T/D/Po/Pe (3 months)	59.2 (n=213)	95.0 (n=774)	87.2 (n=987)
T/D/Po/Pe (4 months)	54.0 (n=211)	94.6 (n=772)	85.9 (n=983)
MenC	52.0 (n=200)	91.7 (n=749)	83.4 (n=949)
Hib	52.5 (n=200)	92.9 (n=749)	84.4 (n=949)
Pneumococcal	47.4 (n=116)	89.2 (n=445)	80.6 (n=561)
MMR1	54.0 (n=200)	95.5 (n=749)	86.7 (n=949)
MMR2	46.7 (n=184)	89.3 (n=652)	79.9 (n=836)
T/D/Po/Pe (B1)	45.7 (n=184)	89.9 (n=652)	80.1 (n=836)
T/D/Po/Pe (B2)	15.2 (n=46)	69.2 (n=159)	57.1 (n=205)
MenC (teenage B)	0 (n=32)	58.8 (n=131)	47.2 (n=163)
HPV	3.6 (n=28)	81.8 (n=88)	62.9 (n=116)

n=number eligible for the vaccine

B = booster

MenC = Meningitis C

Hib = Haemophilus influenzae type B

MMR = Measles/Mumps/Rubella

T/D/Po/Pe = Tetanus, diphtheria, polio, pertussis

Figure 1

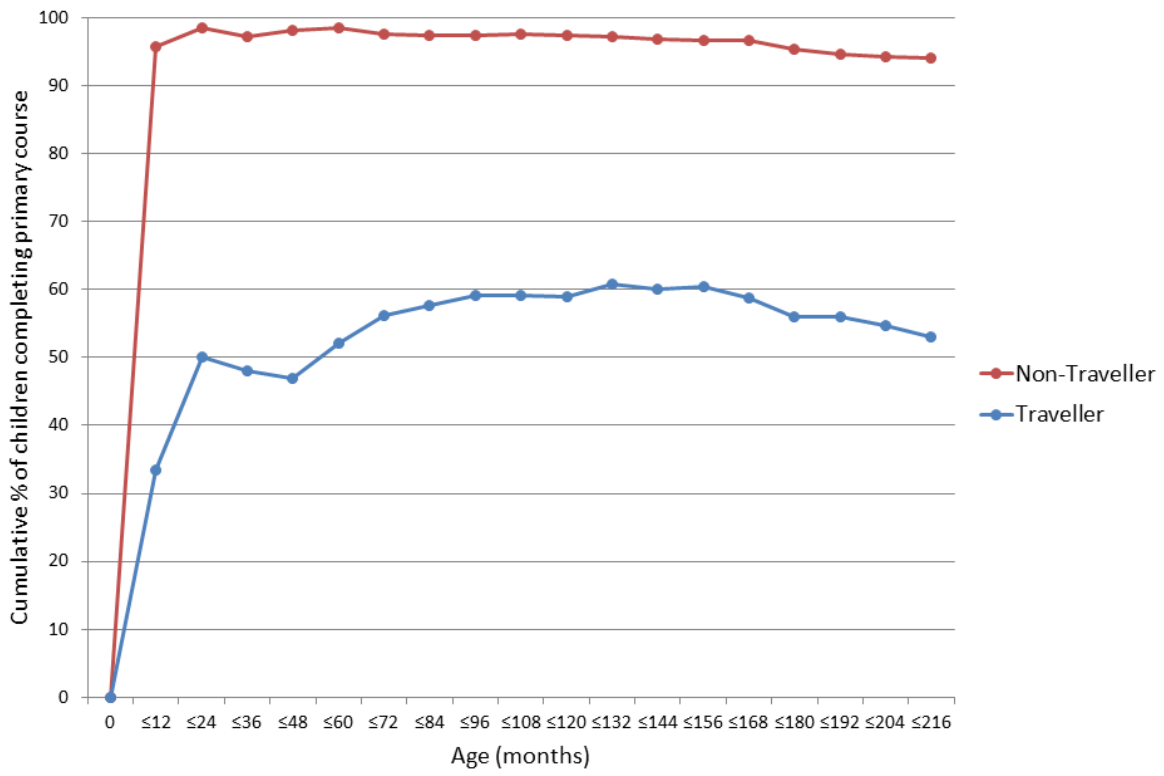


Figure 2

