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1 Introduction and Background

2 UK infant immunisation rates are generally high¹. By five years of age over 95% of children
3 have received at least one dose of the measles-mumps-rubella (MMR) vaccine and 88%
4 have completed the two-dose course¹.

5 However, some communities have significantly lower than the WHO recommended
6 threshold needed to achieve herd immunity leading to increased susceptibility to vaccine
7 preventable diseases. Due to the diversity of these populations and the variety of reasons
8 behind sub optimal vaccination uptake a 'one size fits all' strategy is unlikely to be effective
9 and a more tailored approach is required. The North London borough of Hackney is home to
10 the largest Charedi Orthodox Jewish community in Europe. The community was already
11 established in London in the 1920s and the population increased significantly during the
12 Second World War as new arrivals fled the Holocaust⁸. Membership of this community is not
13 systematically recorded in medical records and is currently estimated at between 25,000 and
14 30,000 people^{9,10}. The community has suffered recurrent outbreaks of vaccine preventable
15 disease, indicating suboptimal vaccination uptake. Charedi families have a much higher than
16 average number of children placing considerable pressure on immunisation services. Local
17 immunisation teams were already aware that immunisation uptake within this community
18 was consistently lower than the rest of the borough and the rest of England for example
19 between January and March 2015 General Medical Practices serving the Charedi
20 community achieved 78% uptake of the first dose of MMR at 2 years of age compared to
21 86% in the rest of the borough¹¹.

22 Sub-optimal immunisation coverage has led to outbreaks of vaccine preventable diseases
23 (VPDs) with measles outbreaks occurring in Hackney in 2007 and 2013. During these
24 outbreaks the Charedi community suffered a higher burden of disease, with an estimated
25 rate of measles of 117 per 100,000 population compared to a rate of 29 per 100,000 for the

26 rest of Hackney¹¹. Due to close links with Charedi communities in other parts of the world,
27 measles was exported from the UK to other countries including Israel¹² and Belgium¹³.

28 It has previously been suggested that parental religious beliefs against vaccination,
29 perceived risk of vaccine preventable diseases, mistrust of the government and perceived
30 insensitive cultural practices of health care providers were key factors behind the suboptimal
31 vaccination uptake, along with issues related to family size, birth order and maternal
32 education^{2,3,4,5}. However, the data available up until now has been limited and fragmented.

33 In 2011, in response to increasing numbers of people refusing or delaying immunisation
34 within the European Region, the European Technical Advisory Group of Experts on
35 Immunisation (ETAGE) asked the WHO Regional Office for Europe to develop tools to help
36 countries address vaccine hesitancy more effectively⁶. This resulted in the development of
37 The Guide to Tailoring Immunization Programmes (TIP) published in 2013⁷. The TIP
38 approach provides a framework based on behavioural insights methodology to enable
39 countries to:

- 40 • identify populations susceptible to vaccine preventable diseases
- 41 • diagnose supply- and demand-side barriers and enablers to vaccination
- 42 • recommend evidence-informed responses to improve vaccination uptake

43

44 The approach involves working very closely with a broad stakeholder group, particularly the
45 communities involved, to identify their beliefs, experiences, requirements and preferences.
46 Some subgroups within communities may be more difficult to engage with or persuade, so
47 the information collected can be used to carry out 'segmentation' to identify specific
48 subgroups within the communities and enable targeted interventions.

49 In 2014 the teams responsible for immunisation services in Hackney decided to use the
50 WHO Tailoring Immunisation Programmes (TIP) approach to fully explore the reasons for
51 sub optimal vaccination uptake within the Charedi community.

52 **Applying the TIP approach in the Charedi Orthodox Jewish Community**

53

54 **Methods**

55 The TIP initiative was carried out within the Hackney Charedi community in 2015/16 with the
56 aim of understanding the barriers and enablers to vaccination. The work was led by
57 representatives from Public Health England (PHE), National Health Service England (NHSE)
58 with support from WHO Regional Office for Europe. TIP offers a step by step process where
59 each step identifies and informs the next e.g. the SWOT analysis led to the decision to carry
60 out the parental survey. The issues highlighted from these steps were then explored in more
61 detail in the qualitative interviews with parents and key informants. The methods and results
62 from each component of the TIP process are detailed in the full report on the gov.uk
63 website¹¹ but the key stages of TIP are outlined in Fig. 1.

64 *Fig. 1: The steps of the TIP process in the North East London Charedi community*

65 An initial stakeholder meeting served to engage key stakeholders and agree on the focus of
66 the TIP process in the community. The meeting was hosted by PHE and included a local
67 Rabbi and representatives from the Homerton University Hospital NHS Foundation Trust, the
68 London borough of Hackney Public Health Department NHS England, and WHO Europe.

69 This led to:

- 70 • mapping of the current immunisation service and support for immunisation
71 within the community.
- 72 • a literature review conducted to build on evidence from research with
73 Charedi communities globally
- 74 • analysis of relevant surveillance and outbreak data.

75

76 A second stakeholder meeting enabled broader stakeholder engagement, additionally
77 including community representatives from three local children's centres, the health policy

78 lead for the Interlink Foundation (umbrella organisation for Orthodox Jewish charities and
79 voluntary organisations) and local health and immunisation service providers. The initial
80 situation analysis was presented, and a Strengths, Weaknesses, Opportunities and Threats
81 (SWOT) analysis was carried out in order to identify barriers and enablers to immunisation.
82 A questionnaire was designed to address key issues identified in this SWOT. These self-
83 completed questionnaires were distributed to parents via General Practices and children's
84 centres. Hebrew and Yiddish translations were available. Parents completing the
85 questionnaire were asked to indicate whether they were interested in taking part in an
86 interview. Key informants including community leaders, commissioners and providers of
87 immunisation services, were approached with the interview study details via email and asked
88 to respond directly to the study team if interested.

89 Data from returned questionnaires was entered onto a database created using EpiData
90 Manager and the analysis carried out using Stata. Ordinal logistic regression assuming
91 proportional odds was used.

92 Parents and key informants expressing interest in being interviewed were contacted by the
93 researchers and written informed consent obtained prior to interview. Semi structured
94 interviews by trained interviewers were carried out with parents and key informants to
95 explore the barriers and enablers identified in the questionnaire in more detail.

96 Interview recordings were transcribed anonymously and the transcriptions were downloaded
97 into a qualitative data analysis software programme (NVivo)

98 Data analysis was mainly thematic although grounded theory techniques were also applied.
99 The analysis proceeded in tandem with data collection and the investigators met regularly to
100 discuss emerging findings and fine tune interview questions accordingly.

101 The relevant research governance and ethics approvals were obtained for both the
102 questionnaire and interview studies.

103 Barriers and enablers identified at all stages of the TIP formative process were analysed to
104 explore behavioural patterns. Issues were grouped according to whether they were societal,
105 community or individual. Parents were grouped according to their beliefs and behaviours to
106 ensure solutions could be tailored to meet the needs of different segments of the community.
107 .

108 **Key findings**

109 **Questionnaire Survey**

110 One hundred and twenty-six questionnaires were returned from General Practices and
111 children's centres between June and September 2015. Of these, 43 (34%) had children who
112 were not up-to-date with their immunisations, 4 (3%) were unsure of their children's
113 vaccination status, and 78 (62%) had children who were up to date with their immunisations
114 (one respondent left this field blank).

115 **Interview studies**

116 We approached 28 Jewish parents, who indicated on the questionnaire that they were willing
117 to be contacted for further information. Of these, 10 parents were interviewed (36%). Six
118 (21%) declined on further contact, and 12 (43%) were unavailable. Of those interviewed,
119 50% of parents stated that their children were fully vaccinated.

120 Of the 38 key informants approached, 10 were interviewed (26%). Fourteen (37%)key
121 informants did not respond, 3 (8%) were not involved in the childhood immunisation
122 programme in the Charedi community, and 11(29%)initially expressed interest but were then
123 unavailable.

124 **TIP process**

125 The findings of the formative process, including mapping of services, data analysis,
126 questionnaire survey, in-depth interviews and three stakeholder meetings, included the
127 following:

- 128 • analysis of surveillance and outbreak data confirmed that uptake of immunisations
129 was lower within the Charedi community and recurring VPDs were placing a burden
130 on the community particularly in children under 4 years of age

131 The questionnaire survey and interview studies confirmed

- 132 • Mothers generally make the decisions around vaccination of their children
- 133 • There was no evidence of community resistance against vaccination for example,
134 related to cultural norms, opinions or religion
- 135 • There was, also little evidence of the concept of childhood immunisation as an
136 important social value within the community
- 137 • Parents who delayed or refused vaccinations did so for reasons that were broadly
138 similar to the wider population for example, concerns about side effects or the
139 mistaken belief that too many vaccinations would over-load an immature immune
140 system
- 141 • Ease of access to booking appointments, child friendly facilities and reducing waiting
142 times were important issues for parents. As an example, due to the higher than
143 average number of children in each family, a lack of waiting room space for small
144 children to play, for storing buggies and long waiting times were identified as barriers
145 to vaccination
- 146 • Community specific initiatives such as community venues, Sunday clinics and
147 Charedi nurse immunisers were identified as enablers to vaccination
- 148 • There are un-met information needs within the community. Community specific
149 information was particularly valued.

- 150 • Interviews with key informants identified pressure on providers of immunisation
151 services due to having to manage a high proportion of young children with no
152 additional resource

153

154 Analysis of the barriers and enablers identified societal, community or individual factors
155 (Table 1).

156

157 Table 1: Barriers and enablers to immunisation uptake within the Hackney Charedi
158 community 2015

159

160 A feedback meeting was held with community members, a senior Rabbi, NHS
161 commissioners and providers, general practice staff, Public Health England, WHO,
162 Government and the qualitative research team from the London School of Hygiene &
163 Tropical Medicine to discuss the findings and to provide input into the grouping of the
164 mothers into specific categories and the development of the recommendations. The
165 behavioural pattern analysis and feedback meeting output enabled four broad categories of
166 mothers to be identified (Table 2). The different categories may need differing strategies
167 whilst also bearing in mind that most mothers fit into more than one category.

168

169 Table 2: Barriers and enablers to childhood immunisation for specific subgroups within the
170 Hackney Charedi Orthodox Jewish community

171

172 **Discussion**

173

174 The results of the formative research and behavioural analysis challenged the assumption
175 that a cultural or religious anti-vaccination sentiment existed within the community. Many of
176 the issues related to access to services. Service providers in the area have challenges due

177 to having to deliver immunisation services to the large numbers of children with no additional
178 resource. This leads to issues in setting up robust invitation and reminder systems,
179 discussing immunisation with families and following up with non-responders. From the
180 parents' point of view, large families with competing pressures makes it challenging to
181 prioritise immunisation particularly if it's difficult to make an appointment and there are long
182 waiting times and no child friendly facilities. One issue highlighted subsequently is the lack of
183 private space for breastfeeding in the waiting area ^{14, 15}

184 Where mothers were choosing to delay or refuse vaccinations their reasons were broadly
185 similar to the wider population and reduced access to mainstream media means that myths
186 or misinformation may circulate for longer within the community¹⁶⁻¹⁸. The behavioural
187 analysis identified potential categorisation of subgroups within the community enabling a
188 more tailored approach to addressing concerns and meeting parents' needs.

189

190 The final feedback meeting with the broader stakeholder group, enabled a series of
191 recommendations for commissioners and providers of immunisation services working with
192 the community to be developed. These are detailed in the main report¹¹ and include
193 recommendations for commissioners to review services to ensure that providers are able to
194 meet the needs of the community. The services commissioned should be flexible,
195 sustainable and the use of community champions or increasing the provision of Charedi
196 immunisation nurse specialists should be considered. Continued close working with
197 community members including religious leadership and use of community media to publicise
198 immunisation information should help to promote immunisation as a social norm. Information
199 should also include social norm messaging such as 'most people within the community get
200 their children immunised on time'.

201

202 TIP is not a project with an end, but rather a long-term process to ensure sustainable health
203 behaviour change through understanding the needs of the intended beneficiaries. Since the
204 development of the recommendations NHS commissioners and the relevant General

205 Practices have been working in partnership to provide sustainable solutions. This includes
206 developing flexible appointments in family friendly surroundings, robust call and recall
207 systems and improving data collection. The General Practices have also collaboratively
208 employed culturally sensitive nurses to work across the practices to increase uptake. As
209 another important outcome of the process, the Charedi community representatives engaged
210 in the process are still actively advocating for immunisation in their community. Community
211 members and religious leaders were involved at all stages of the project and were key to its
212 success. The chief Rabbi with responsibility for health who is pro-immunisation and a
213 representative from the Interlink foundation (an umbrella organisation for Orthodox Jewish
214 charities) were and continue to be, keen supporters of the project and advocates for wider
215 community engagement.

216

217 As part of the way forward it is a critical recommendation of the main report that all
218 community specific interventions are fully evaluated so that effective sustainable solutions
219 can continue to be developed and refined.

220

221 **Conclusions**

222 The TIP approach was an effective way of investigating factors linked to sub-optimal
223 immunisation within the Charedi community confirming some assumptions and challenging
224 others. The use of behavioural insights including segmentation enabled the categorisation of
225 subgroups so that more targeted interventions could be developed. The comprehensive
226 stakeholder engagement which is a key pillar of the TIP approach ensured a deeper
227 understanding of the barriers and enablers to vaccination as well as increasing ownership in
228 the community. TIP should be considered as a useful approach to identify communities or
229 populations with sub-optimal immunisation uptake and to help identify their main enablers
230 and barriers to vaccination.

231 **Conflicts of interest**

232 There are no conflicts of interest to declare.

233

234 The authors alone are responsible for the views expressed in this article and they do not
235 necessarily represent the views, decisions or policies of the institutions with which are
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