

How do pharmacy students select their pre-registration training providers?

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Title: How do pharmacy students select their pre-registration training providers? A mixed methods evaluation of the national recruitment scheme in England and Wales

Abstract

Objectives

A national pre-registration pharmacist recruitment scheme, which replaces the local recruitment models, was introduced in England and Wales in 2017. This study aimed to explore pharmacy students' behaviour and associated factors in their selection of pre-registration training programmes.

Methods

A mixed method study using a) analysis of data from all applicants (n=2694) of the national recruitment scheme b) an online survey and c) a virtual focus group was undertaken. Survey and focus group questions were developed based on the theoretical-domains-framework (TDF). **Descriptive and inferential analysis of quantitative data was undertaken using Stata software. Qualitative data from focus groups and responses from the open-ended questions were analysed using framework technique.**

Key findings

A vast majority of applicants (n=2182, 83.9%) selected a hospital training programme as their first ranked preference, with the rest opting for community pharmacy. Urban areas, particularly London, were most popular geographically. A total of 307 survey responses were returned. Long-term career aspirations, followed by geographical factors, were rated most highly in applicants' decision making. Qualitative data from survey and focus group demonstrated information about programmes/employers, perceived opportunity for skills development and aspiration towards a career path as key contributory factors in their decision-making.

31

32 **Conclusions**

33 Secondary care was the most desirable destination for pharmacy students to undertake
34 early career training. The clinical roles and career opportunities in community pharmacy
35 needs to be promoted as there is a risk that community pharmacy training programme
36 places may be seen as a 'left over' opportunity for less competitive candidates to uptake.

37

38 **Keywords**

39 Professional Training, Education

40 Career Choices, Education

41 Student Attitudes

42 Other topics, Education

43

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47 **Introduction**

48 **In order to register as a pharmacist in Great Britain, the General Pharmaceutical Council**
49 **(GPhC) requires a person to undertake four years of educational training, normally**
50 **through Master of Pharmacy (MPharm) Course from an accredited University in the UK or**
51 **through Overseas Pharmacists Assessment Programme (OSPAP), followed by successful**
52 **completion of a 52-week programme of pre-registration training in Great Britain and to**
53 **pass a registration assessment conducted by the GPhC.**^[1] Pre-registration pharmacist
54 training in the NHS is funded by Health Education England (HEE), a non-departmental
55 public body which aims to support the delivery of healthcare and health improvement to
56 the patients and public of England by ensuring that the workforce has the 'right
57 numbers, skills, values and behaviours, at the right time and in the right place'.^[2]
58 Community pharmacies can also offer pre-registration training programmes through
59 provision of training grants from NHS England. In 2015 HEE launched a Pharmacy
60 Education Reform Programme to improve the quality of pre-registration pharmacist
61 training. A key project within this was the development of a national Pre-registration
62 Pharmacist Recruitment Scheme for England and Wales.^[3] The scheme was introduced
63 for applicants graduating in 2017; mandated for all HEE funded places on training
64 programmes in the NHS sector and optional for other sectors. **In year one, 77%**
65 **(n=2161) of available pre-registration training places were advertised via this route. Of**
66 **these, the majority (n=1427) were in a community pharmacy setting**^[4] **representing**
67 **70% of available places on training programmes in this sector.**

68

69 The centralised system of recruitment uses an electronic platform similar to those used
70 for medicine, dentistry and healthcare science and replaces the previous localised and
71 employer-led recruitment. The new system allows students in year 3 of MPharm to apply

72 through a single application for all pre-registration training programmes across the
73 secondary care (i.e. hospital) and community sectors throughout England and Wales. In
74 the application system, students can categorise training programmes into three
75 categories namely a) Ranked preferences: Students can rank their order of their
76 preferred programmes (e.g. rank 1 for the most desirable employer, rank 2 for the
77 second most desired programme etc.); b) No preference: Students can list programmes
78 in the second column and will get allocated to one of the training programmes in 'no
79 preference' category if none of their ranked preferences from category a are available;
80 c) not wanted: students can deselect programmes that they do not want to accept, e.g.
81 from a geographical area where they do not wish to train [supplementary material 1].
82 Students undergo situational judgement tests; multiple mini interviews including a
83 scenario-based exercises reflection on past experiences and problem solving; and
84 numeracy test [supplementary material 2].^[4] Students are offered a place based on their
85 test performances, matched with how they categorised the available training
86 programmes during the application stage.

87

88 In HEE's own internal evaluation^[4], an overall fill rate of 75% of pharmacy pre-
89 registration training places was achieved in the first national recruitment cycle. This was
90 despite the total number of applicants outnumbering the available programme places
91 and the presence of applicants who could not be appointed despite passing the
92 assessment. Such lack of appointments could be linked to how students selected the
93 programmes during their application process. For example, if a student listed only 10
94 preferred training programmes (including 'ranked' and 'no preference') and listed all
95 other programmes under 'not wanted' in the application system, this could result in a
96 student not getting any offer if all of the 10 preferred programmes were ranked by other
97 students who performed better in the assessments than the concerned individual.

98

99 Factors associated with early career choices of pharmacy students have been under-
100 researched. It is known from the published literature that healthcare students including

101 pharmacy students are often attracted towards secondary care settings for their early
102 career training and this often negatively impacts on the recruitment and retention in
103 primary care and particularly in the rural settings.^[5-10] Those students who opt to choose
104 hospital pharmacy programmes placed more emphasis on the importance of patient and
105 multi-disciplinary working, opportunities for career progression, further education and
106 professional development. Other motivators for secondary care training programmes
107 include perceived higher professional status, research opportunities and academic
108 environment.^[5,6] By contrast, those opting for primary care including community
109 pharmacy often regard financial rewards, the spectrum of patients and diseases
110 encountered in community as the motivators.^[5,6] National health systems and health
111 care models of a country can also impact upon training and career choices of healthcare
112 professional students.^[5] Analysis of the applicant data from the national recruitment
113 scheme, and investigation of factors associated with applicants' decisions can be
114 valuable to employers, educators and wider stakeholders associated with pharmacist
115 pre-registration training. **Student perspectives on the new national recruitment system**
116 **has been recently published which showed that respondents were generally satisfied with**
117 **the application process and commended the fairness of the selection methodology and**
118 **convenience in allowing them to apply to multiple training providers.^[11]** This paper aims
119 to address the dearth of literature on how and why pharmacy students select their pre-
120 registration training programme placements.

121

122 This study aimed to investigate pharmacy students' selection of pre-registration training
123 programmes and factors influencing their decision-making process.

124

125 **Methods**

126 A mixed-method approach was used. This included: Phase 1: analysis of all applicant
127 (n=2694) data from the HEE pre-registration recruitment scheme in 2017/18, Phase 2:
128 A web-based survey of all students undertaking Master of Pharmacy Year 4 or the

129 Overseas Pharmacist Assessment Programme (OSPAP) who were eligible to apply to the
130 2017/18 scheme, followed by Phase 3: a focus group with students.

131

132 For phase 1, anonymised data about individual applications was obtained from the HEE
133 Pharmacy National Recruitment Office. These data included applicant demographic
134 information, i.e. ethnicity, gender, school of pharmacy, along with their pre-registration
135 training programme preferences including ranked, no-'preference' and 'not wanted'
136 categories. Data were analysed by a statistician (MJP) using Stata version 15 software.
137 Descriptive statistics was used to identify those who exclusively selected either
138 community or hospital sector programmes, or both. Trends in the top ranked (including
139 first, top 10 and top 30) practice sector preferences (i.e. hospital or community training
140 programmes) were extracted based on the total number of times each sector featured in
141 applicants' selections of training programmes. Top ranked preferences were cross
142 tabulated with gender and ethnicity variables. The total number of times each
143 geographical area featured was also reported. Exact Binomial 95% Confidence intervals
144 were calculated for all data using the Clopper-Pearson method.^[12]

145

146 For phases 2 and 3, a whole population sampling method was used. The survey
147 questionnaire consisted of 27 questions; a mix of closed and open-ended questions,
148 including the use of Likert-type agree/disagree statements, with three sections exploring
149 a) applicant views, experiences and factors affecting their preferencing of prospective
150 employers b) applicants perceptions of their offer outcome in the context of their
151 preferencing decisions and c) what factors influenced non-participation in the scheme
152 [supplementary material 3]. Respondents were asked about the factors influencing their
153 decisions at each stage of the process and to rate the importance of these factors on a
154 scale of 0 (no influence at all) to 5 (a lot of influence). All survey respondents were given
155 the option to express interest in participation in focus group via a specific question in the
156 survey. This data was removed prior to review and analysis, so that survey responses
157 remained anonymous.

158

159 The survey and the topic guide for the qualitative study were designed using existing
160 literature, research team input and discussion amongst the national evaluation steering
161 group members which consisted of study researchers (LMS, VP, GF, TS), student,
162 employer, academic, assessor and HEE representatives. The Theoretical domains
163 framework (TDF) was used to construct the questions around factors associated with
164 decisions in both the questionnaire and the focus group topic guide. TDF is a validated
165 theoretical framework of determinants of behaviour which combines 33 theories of
166 behaviours into 14 domains.^[13] The domains can be used to explain the factors that are
167 associated with a particular behaviour and these include knowledge, skills,
168 environmental context and resources, capabilities, belief about consequences and social
169 influences. TDF has been widely adopted in health care and education research in
170 understanding and changing behaviours and investigating implementation problems.^[14]

171

172 In April 2018, Heads of Schools and pre-registration training recruitment leads in all
173 Schools of Pharmacy in the UK (n=32) were requested to circulate a letter and link to an
174 online questionnaire to all 4th Year MPharm and OSPAP students that were eligible to
175 apply for a pre-registration training position through Oriel (n=approx.2800). The survey
176 was open for five weeks, with reminder emails sent at two- and four-week intervals
177 using the same distribution method. Data were analysed using descriptive and inferential
178 statistics using STATA version 15 (College Station, Texas, USA). Comparisons were
179 made across gender and ethnicity variables.

180

181 One focus group was held online, utilising WebEx, with discussion lasting 60 minutes.
182 Participants were sent an information sheet and asked to return a signed consent form
183 prior to the event. Focus group proceedings were transcribed verbatim. Qualitative data
184 from focus group and responses from the open-ended questions from the questionnaire
185 were analysed together using the framework technique.^[15] A thematic coding
186 framework was developed based on the research aims and objectives, topic guide and

187 TDF, following familiarisation with the data. A final coding framework was agreed after
188 analysis of few quotes from the questionnaire and the focus group transcript. Any new
189 emergent themes were added during the analysis. Duplicate independent coding and
190 analysis of the qualitative data was undertaken by VP and LMS.

191

192 Ethical approval for the study was obtained from *** (anonymised). The work was
193 carried out in accordance with the Declaration of Helsinki, including, but not limited to
194 the anonymity of participants being guaranteed and the informed consent of participants
195 being obtained.

196

197 **Results**

198 Phase 1: Analysis of applicant data

199 Data from all applicants (n=2694) to the 2017 pre-registration training recruitment
200 scheme were available. Of these 1,746 (64.8%) applicants were female and 890
201 (33.0%) were male. A total of 234 hospital programmes (734 places NB: one
202 programme may include more than one training place) and 1082 Community Pharmacy
203 programmes (1427 places) were available for selection and ranking by the applicants.
204 Most (n=2325, 86%) applicants selected pre-registration programmes across both
205 hospital and community pharmacy sectors. Two hundred and eighty-three (283, 11%)
206 and 86 (3%) applicants selected pre-registration programmes in hospital or community
207 pharmacy sectors only respectively (table 1).

208

209 Table 1 to be inserted here

210

211 A large majority, 2182 (83.9%) of applicants ranked a hospital programme as their first
212 choice for a pre-registration place representing 85% (n=735) of male applicants and
213 83.5% (1401) of female applicants (table 1). In contrast, 16.1% (418) applicants ranked
214 community pharmacy programmes as their first choice (table 1). Preferences across

215 male and female applicants were similar, however ethnic variations in patterns were
216 observed (table 1).

217

218 Top 10 and 30 ranked preferences were also dominated by hospital pre-registration
219 programmes. A total of 25,252 top 10 ranked preferences (or all preferences where any
220 applicant ranked fewer than 10 programmes) from all applicants (n=2694) were
221 analysed. A total of 80.6% and 19.4% of the total top 10 ranked preferences related to
222 pre-registration programmes within hospital and community pharmacy sector
223 respectively. A similar pattern was observed during the analysis of top 30 ranked
224 preferences (n=65,151).

225

226 Geographically, urban areas, particularly London, was most popular with approximately
227 4 in 5 applicants (80.6%) selecting at least one London-based programme (table 2).
228 Applicants also sought training programmes in the same HEE region as their schools of
229 pharmacy. For example, a large majority of applicants (98.1% and 89.1% respectively)
230 from the two universities located in West Midlands region of England selected at least
231 one programme from within the region, outnumbering their preferences in other regions.

232

233 Table 2 to be inserted here

234

235 Phase 2 (Survey): Factors associated with decision making

236 Three hundred and seven survey responses were received (approximate response rate:
237 11%). Long-term career aspirations for working in a particular sector was the factor
238 rated most highly by the respondents, followed by proximity to respondents' permanent
239 home or where they would like to live long-term (table 3). Information provided by the
240 employer about their organisation and training programme was also important for many
241 with over 57% of the respondents rating this factor 4 or 5 out of 5.

242

243 Table 3 to be inserted here

244

245 Respondent age, gender or ethnicity influenced ranking of three factors. Male
246 respondents ranked the importance (5 out of 5) of salary higher than female
247 respondents (26% vs 16% $p= 0.017$). Those aged 25 or over rated long-term career
248 aspirations more highly (5 out of 5) than younger respondents (68% vs 64% $p=0.041$).
249 Tier 2 sponsorship availability through the employers, i.e. work permit requirements for
250 immigration purpose, was important for respondents of 'any other ethnicity' 43% ($n=16$)
251 compared to, for example, only 3% ($n=4$) of the respondents of any white ethnicity
252 ($p<0.001$).

253

254 Qualitative data from survey and focus group

255 A rich, in-depth data set from 200 respondents from the open-ended questions
256 contained in the questionnaire was obtained. One focus group was held with four
257 participants. Two focus groups were intended; however, the second focus group had no
258 attendance by any scheduled participant. Further recruitment effort was not deemed
259 necessary as the preliminary analysis of the responses to open ended comments from
260 over 200 respondents and one focus group data provided assumption that data
261 saturation was achieved. The datasets were analysed together. A total of eight factors
262 linked to TDF were identified and these are summarised in table 4. They are described
263 below with further illustrative narratives and quotes.

264

265 Table 4 to be inserted here

266

267 a) Knowledge about the training programmes and prospective employers

268 Participants alluded to the importance of the information provided by employers in the
269 online application system in informing their decisions. Participants described reading the
270 information sources carefully before making a selection. While participants did speak
271 highly of information from some employers, in particular from hospitals, they felt that

272 other employers did not give key information they were looking for. These included
273 working pattern, availability of accommodation and detailed breakdown of pay rates.

274

275 'With the hospitals, they (information provided) were a lot more different, like one hospital trust would
276 offer something, the other one would offer something else whereas with the community, especially the
277 big chains they were all just copy, like they all sound the same...' [Focus Group P2]

278

279 b) Environmental context and resources: programme type, resources, locality

280 Size of the employing organisation was a key factor in selecting a community pharmacy
281 pre-registration programme, with most participants preferring large chain multiple
282 pharmacies to smaller, independent community pharmacies. Such preference was linked
283 to perceived higher quality of training programmes in large chain pharmacies.

284

285 'I did preference the large chain over the independents cause I think when it comes to the quality of
286 the teaching you get it, because you know the large chains have a structured programme, unless
287 you've, like you've had a chance to say go for a week, or a few day in an independent, it's quite
288 difficult to know how, like, how good the quality of teaching you'd get would be.' [Focus Group P4]

289 **Participants described the importance of locality when selecting a community pharmacy**
290 **pre-registration programme because of the local patient/customer base.**

291

292 Some participants described a reluctance to undertake pre-registration training in
293 remote and rural locations. They preferred living in an urban environment and perceived
294 better opportunities available in urban areas. However, some participants expressed
295 willingness to go to rural areas if no hospital training programmes were available in
296 urban areas.

297

298 c) Belief about consequences

299 Participants described that selecting the right employer would enable them to be 'the
300 best' pharmacist as a consequence.

301

302 'I can become the best pharmacist that I can become as a result of that (selecting the 'best'
303 employer).' [Focus Group P4]

304

305 d) Social influences

306 The importance of family and peer opinion were described and they also mentioned
307 seeking advice from the trainees who had trained with their preferred employers and
308 programmes. Some participants also described that speaking with acquaintances
309 compensated for a lack of information from employers.

310

311 'I think for me it's because I know a lot of people who have been through like *** (a large multiple)'s
312 pre-regs or *** (a large multiple)'s pre-regs and they've all spoke quite highly of them so I think I
313 trusted them a bit more than like an independent that I'd never really heard of.' [Focus Group P1]

314

315 e) Memory, attention and decision process

316 Hospital training programmes were deemed to be more competitive and many applicants
317 deemed it was important for applicants to select 'back ups'. Participants described
318 various strategies to inform their decisions. One participant mentioned making their own
319 spreadsheet and weighing the 'pros and cons' of the programmes against factors that
320 were important to them.

321

322 'I kind of had like a table I'd mocked up myself in word with specific columns like wages, distance
323 from home, things like that so, I went through each position one by one and kind of wrote down those
324 key facts so then later when it came to your preferencing process opening up it was quite quick to just
325 drag and drop into the columns that I wanted in the order that I wanted.' [Focus Group P2]

326 'I had gone for the ones near home for the community [programmes in my preferences], because I
327 knew I wanted hospital more than community, I made the choice that if I got community I'd want one
328 near home. Purely because I think I was more willing to make a sacrifice on where I was living for a
329 hospital place rather than a community place.' [Focus Group P4]

330

331 f) Social, professional role and identity

332 Most participants had aspired to become 'hospital' pharmacist and they perceived pre-
333 registration training to be a stepping stone to fulfil their aims.

334

335 'I preferred over 200 hospital places and put some community in the no preference section just in
336 case although I strongly believed 200 hospitals would be enough (to get me a place), however I was
337 offered one of the community places that I actually didn't want. I had to accept with upgrades and
338 hope for a hospital upgrade however I was not offered an upgrade and I later rejected my original
339 offer as I didn't want to work in a community pharmacy.' [Survey P142]

340

341 'I am lucky that I got my preferred hospital, but I would have been extremely dissatisfied if I ended
342 up in community as this was never my wish.' [Survey P43]

343

344 g) Skills/ Opportunity for skills development

345 Perceptions around skills development was often informed by the information provided
346 by the employers in the application system.

347

348 '...the main things (informing my decision making) was like the practical experience that I could get
349 from them.' [Focus Group P3]

350 '(I wished there was) more information about each training place offered for example providing a
351 sample timetable for the year so that candidates can understand better about how the year at that
352 place would be.' [Survey P103]

353

354 h) Motivation and goals

355 Participants described high motivation in securing the programmes and employers they
356 ranked highly. Some were willing to sacrifice their geographical preference if it meant
357 obtaining an offer from a highly ranked programme.

358

359 'Even though it wasn't anywhere near where I lived it was just because I thought, this has been
360 recommended as a really good teaching programme that I might as well go out there and try my best
361 to get that programme...' [Focus Group P4]

362

363 **Discussion**

364 **Summary of key findings**

365 Pharmacy students showed a high affinity towards hospital pre-registration programmes.
366 The workforce census of the General Pharmaceutical Council suggests approximately
367 71% and 21% of UK registered pharmacists work in the community and hospital sectors
368 respectively.^[16] However, this study has shown that most applicants preferred to train in
369 a hospital. Although a further 25% of community pharmacy pre-registration places are
370 available outside the national recruitment scheme, the results show that hospital pre-
371 registration programmes were highly oversubscribed.

372

373 **Strengths and limitations**

374 This is the first large scale evaluation of applicant behaviour in relation to their
375 programme selection for a pharmacist pre-registration training programme in the UK. A
376 complete dataset from the applicants of the 2017/18 recruitment cycle was available
377 followed by a large-scale survey. Use of TDF allowed a systematic data collection and
378 interpretation in relation to factors associated with decision making. The responses to
379 the survey and focus group were low. This can be explained by the survey and focus
380 group being conducted during Master of Pharmacy final year exam period. Also, there
381 may have been differences in the level of engagement with the invitation from different
382 Schools of Pharmacy as the response rate varied across Schools. The low response rate
383 of the survey limits the external validity of the findings. We compared the survey
384 respondents with the demography of the national applicant data which suggested that
385 respondents were comparable with regards to the sex distribution (total females
386 amongst 2,694 national applicants were 64.8% vs 76.0% in our survey).

387

388 **Discussion in the context of available literature**

389 Greater affinity of students towards hospital training programmes is a phenomenon
390 reported in the limited literature from other (non-pharmacy) healthcare professional

391 disciplines.^[5] Medical students' attraction towards secondary care settings for a training
392 place may negatively impact on the recruitment and retention in primary care.^[5,6]
393 Pharmacy students who opted to choose a hospital-based career placed more emphasis
394 on the importance of patient and multi-disciplinary working, opportunities for career
395 progression, further education and professional development.^[5,6] In addition, perceived
396 higher professional status, research opportunities and academic environment in hospital
397 settings have also been described. A different perspective is demonstrated by those
398 opting for primary care, including community pharmacy, who often regard financial
399 rewards, the spectrum of patients and diseases encountered in community as the
400 motivators.^[5,6] While pharmacy students regard higher earning potential in community
401 pharmacy, literature suggests that factors such as opportunities for career progression,
402 interaction with patients, further education and professional development are perceived
403 to be better in hospitals than in a community pharmacy environment.^[5,6]

404

405 More extensive clinical roles and diversification of the pharmacy workforce have begun in
406 the UK in relation to recent policy initiatives. This includes recruitment of pharmacists
407 and pre-registration opportunities in general practices.^[16,17] Long-term evaluations are
408 needed to investigate how career aspirations of pharmacy students change over time.

409

410 There was a strong geographical variation in the selection of pre-registration
411 programmes with programmes in London highly preferred. Qualitative data suggested
412 applicants' desire to live in an urban environment and further career opportunities were
413 key factors associated with such decisions. Social isolation and lack of family support are
414 amongst key barriers to uptake of the rural training programmes by pharmacy graduates
415 as reported in the literature.^[7,8] It has been shown that rural placements during
416 undergraduate degrees can change such perceptions.

417

418 The disregard of salary as an influencing factor may be down to subtle differences in the
419 salaries across training programmes.^[9] However, in countries where such pre-

420 registration training programmes do not constitute a pre-requisite for professional
421 registration as a pharmacist, the comparatively low salary of the trainees against early
422 career positions are known to dissuade students from up taking such training
423 positions.^[10] Salaries can however, influence long term career aspiration.^[6] A review of
424 international literature that aimed to identify facilitators to primary care training
425 environment related to exposure to rural location, role models, working conditions; while
426 barriers included low income and prestige.⁵ Often these factors were setting specific. For
427 example factors specific to middle- and low-income countries were: understanding of
428 rural needs and intellectual challenge and those specific to high-income countries
429 included attitude towards social problems, voluntary work, influence of family, and
430 length of residency.^[5]

431

432 **Conclusion**

433 Similar to the phenomenon observed with other clinical disciplines, most pharmacy
434 students aspire to undertake pre-registration training in hospitals and consider long-term
435 career aspirations very important when selecting their pre-registration training. Urban
436 areas were preferred over rural ones. The evaluation necessitates promotion of the
437 clinical roles and career opportunities available in community pharmacy by educators,
438 employers and wider stakeholders, as published literature suggest perceived lack of
439 clinical roles is a key reason for low attraction towards community pharmacy training
440 places. Therefore there is a risk that community pharmacy may be seen as a 'left over'
441 role for less competitive candidates. Recruitment in remote and rural areas may benefit
442 from widening awareness of the job opportunities available for pharmacists.

443

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495 Table 1: Applicants' (n=2694) first ranked preferences: number of applicants by gender and ethnicity who ranked NHS Acute Hospital or Community
 496 Pharmacy sector as their first choice

	Hospital programmes as first ranked preference*				Community Pharmacy programmes as first ranked preference*			
	Number of applicants	%	lower 95% CI	Upper 95% CI	Number of applicants	%	lower 95% CI	Upper 95% CI
All	2182	83.9	82.5	85.3	418	16.1	14.7	17.5
Female	1401	83.5	81.7	85.3	276	16.5	14.7	18.3
Male	735	85.0	82.4	87.3	130	15.0	12.7	17.6
Ethnicity								
White – British	483	90.3	87.4	92.7	52	9.7	7.3	12.6
White – Irish	18	85.7	63.7	97.0	3	14.3	3.0	36.3
Any other white background	65	82.3	72.1	90.0	14	17.7	10.0	27.9
Mixed White and black Caribbean	4	66.7	22.3	95.7	2	33.3	4.3	77.7
Mixed White and black African	6	85.7	42.1	99.6	1	14.3	0.4	57.9
Mixed White and Asian	11	52.4	29.8	74.3	10	47.6	25.7	70.2
Any other mixed background	14	93.3	68.1	99.8	1	6.7	0.2	31.9
Asian or Asian British – Indian	344	79.1	75.0	82.8	91	20.9	17.2	25.0
Asian or Asian British – Pakistani	270	82.3	77.7	86.3	58	17.7	13.7	22.3
Asian or Asian British – Bangladeshi	79	78.2	68.9	85.8	22	21.8	14.2	31.1
Any other Asian background	184	83.6	78.1	88.3	36	16.4	11.7	21.9
Black or Black British – Caribbean	11	84.6	54.6	98.1	2	15.4	1.9	45.4
Black or Black British – African	280	87.8	83.7	91.2	39	12.2	8.8	16.3
Any other black background	12	100.0	100.0	100.0	0	0.0	0.0	0.0
Chinese	194	81.9	76.3	86.5	43	18.1	13.5	23.7
Any other ethnic group	126	84.6	77.7	90.0	23	15.4	10.0	22.3
Not stated	56	81.2	69.9	89.6	13	18.8	10.4	30.1

497 *reflects percent within category for gender and ethnicity data; missing data not included in the table
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499 Table 2: Distribution of student preferences of programmes across HEE local areas by all
 500 applicants (n=2694)*
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Geographical areas	Number of available programmes/ places (a)	Number of applicants (b)	Proportion	lower 95% CI	Upper 95% CI
London	283/521	2171	80.6	79.0	82.1
East of England	141/228	1974	73.3	71.6	74.9
West Midlands	96/204	1939	72.0	70.2	73.7
North West	112/181	1905	70.7	69.0	72.4
Kent, Surrey and Sussex	146/197	1881	69.8	68.0	71.6
East Midlands	80/146	1844	68.4	66.7	70.2
Thames Valley	47/78	1808	67.1	65.3	68.9
Yorkshire and the Humber	112/164	1725	64.0	62.2	65.8
South West	105/150	1705	63.3	61.4	65.1
Wessex	51/93	1595	59.2	57.3	61.1
North East	59/98	1523	56.5	54.6	58.4
Wales	68/101	1514	56.2	54.3	58.1

502 *relates to proportion of applicants who selected at least one programme from within the region.
 503 Note: Data at a county levels are available on request from authors.

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Table 3: Respondent ranking of the factors influencing preferencing decisions

Factors	5 (a lot of influence) n (%)	4 n (%)	3 n (%)	2 n (%)	1 n (%)	0 (no influence at all) n (%)
Proximity to my University/School of Pharmacy	19 (6.5%)	21 (7.1%)	42 (14.3%)	33 (11.2%)	22 (7.5%)	157 (53.4%)
Proximity to my permanent home or by where I would like to live long-term	179 (60.7%)	45 (15.3%)	26 (8.8%)	7 (2.4%)	4 (1.4%)	34 (11.5%)
Existing relationship/s with the employer/s	34 (11.5%)	24 (8.1%)	31 (10.5%)	21 (7.1%)	20 (6.8%)	165 (55.9%)
Long-term career aspirations for working in a particular sector	187 (63.4%)	52 (17.6%)	30 (10.2%)	6 (2%)	5 (1.7%)	15 (5.1%)
Size of the employing organisation	62 (21.1%)	63 (21.4%)	71 (24.1%)	37 (12.6%)	15 (5.1%)	46 (15.6%)
Salary	56 (19%)	66 (22.4%)	61 (20.7%)	33 (11.2%)	23 (7.8%)	55 (18.7%)
Information made available by the employer about their organisation and training programme	81 (27.5%)	89 (30.2%)	58 (19.7%)	31 (10.5%)	14 (4.7%)	22 (7.5%)
Perceived ease of gaining a training place	39 (13.2%)	40 (13.6%)	60 (20.3%)	43 (14.6%)	40 (13.6%)	73 (24.7%)
Tier 2* sponsorship availability	30(10.2%)	0 (0%)	11 (3.7%)	2 (0.7%)	10 (3.4%)	242 (82%)
Peer opinion	12 (4.1%)	36 (12.2%)	46 (15.6%)	42 (14.3%)	28 (9.5%)	130 (44.2%)
Family opinion	29 (9.8%)	50 (16.9%)	60 (20.3%)	52 (17.6%)	21 (7.1%)	83 (28.1%)

Top three factors rated most highly by the respondents appear in grey *work permit required by UK Home Office for skilled immigration- applicable to international students

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509 Table 4: Factors associated with applicant decisions: TDF themes

Themes in relation to TDF domain	TDF descriptor ⁶	Sub themes
Knowledge	An awareness of the existence of something	Knowledge about training programmes
		Knowledge about the employers
		Knowledge about the geographical and demography information
Skills	An ability or proficiency acquired through practice	Perceived opportunity for skills development
Social/Professional Role and Identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	Career aspiration as a hospital pharmacist
		Career aspiration as a community pharmacist
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour	Perceived quality of the training
		Sector of training, hospital or community
		Size of the community pharmacy employer, i.e. large multiple vs independents
		Preference to train in an urban environment
Goals, motivations and Intentions	Mental representations of outcomes or end states that an individual wants to achieve	Local demography of community pharmacy
		Motivations to train with a 'reputable' employer
		Motivation to train in the preferred sector (mostly hospital)
Beliefs about consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation	Motivation to train in the preferred location
		Belief about securing the desired training places
Beliefs about capabilities	Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use	Consequences of preferencing 'wisely'
		Consequences of selecting best employers and programmes
Emotions	A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or	Optimism or pessimism about securing a preferred programme

	event	
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives	Decision making process
		Number of programmes preferred by the applicants
		Time frame to decide on the preferencing decisions
Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours	Opinion of pre-registration pharmacists
		Opinion of family and friends
		Opinion of pharmacists/tutors obtained during placements or work experiences

510 TDF: Theoretical domains framework