

# A cross sectional study of unmet need for health services amongst urban refugees and asylum seekers in Thailand in comparison with Thai population, 2019

**RAPEEPONG SUPHANCHAIMAT** (✉ [rapeepong@ihpp.thaigov.net](mailto:rapeepong@ihpp.thaigov.net))

Ministry of Public Health <https://orcid.org/0000-0002-3664-9050>

**Pigunkaew Sinam**

International Health Policy Program, Ministry of Public Health

**Mathudara Phaiyaron**

International Health Policy Program, Ministry of Public Health

**Nareerut Pudpong**

International Health Policy Program, Ministry of Public Health

**Sataporn Julchoo**

International Health Policy Program, Ministry of Public Health

**Watinee Kunpeuk**

International Health Policy Program, Ministry of Public Health

**Panithee Thammawijaya**

Department of Disease Control, Ministry of Public Health

---

## Research

**Keywords:** Urban refugee, asylum seeker, unmet need, healthcare, Thailand

**Posted Date:** November 2nd, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-35092/v3>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

**Version of Record:** A version of this preprint was published on November 11th, 2020. See the published version at <https://doi.org/10.1186/s12939-020-01316-y>.

1 **A cross sectional study of unmet need for health services**  
2 **amongst urban refugees and asylum seekers in Thailand in**  
3 **comparison with Thai population, 2019**

4 **Authors**

5	Rapeepong Suphanchaimat (RS) <sup>1,2*</sup>	rapeepong@ihpp.thaigov.net
6	Pigunkaew Sinam (PS) <sup>2</sup>	pigunkaew@ihpp.thaigov.net
7	Mathudara Phaiyarom (MP) <sup>2</sup>	mathudara@ihpp.thaigov.net
8	Nareerut Pudpong (NP) <sup>2</sup>	nareerut@ihpp.thaigov.net
9	Sataporn Julchoo (SJ) <sup>2</sup>	sataporn@ihpp.thaigov.net
10	Watinee Kunpeuk (WK) <sup>2</sup>	watinee@ihpp.thaigov.net
11	Panithee Thammawijaya (PT) <sup>3</sup>	viewfotp@gmail.com

12 **Affiliations**

- 13 1. Division of Epidemiology, Department of Disease Control, Ministry of Public Health, Thailand  
14 2. International Health Policy Program (IHPP), Ministry of Public Health, Thailand  
15 3. Division of Innovation and Research, Department of Disease Control, Ministry of Public Health,  
16 Thailand

17 \*Correspondence

18

19 **Abstract**

20 **Background**

21 Although the Thai government has introduced policies to promote the health of migrants, it is still  
22 the case that urban refugees and asylum seekers (URAS) seem to be neglected. This study aimed to  
23 explore the degree of healthcare access through the perspective of unmet need in URAS, relative to  
24 the Thai population.

25 **Methods**

26 A cross-sectional survey, using a self-reporting questionnaire adapted from the Thai Health and  
27 Welfare Survey (HWS), was performed in late 2019, with 181 URAS completing the survey. The  
28 respondents were randomly selected from the roster of the Bangkok Refugee Center. The data  
29 of the URAS survey were combined with data of the Thai population (n=2,941) from the HWS.  
30 Unmet need for health services was defined as the status of needing healthcare in the past twelve  
31 months but failing to receive it. Bivariate analysis was conducted to explore the demographic and  
32 unmet need difference between URAS and Thais. Multivariable logistic regression and mixed-effects  
33 (ME) model were performed to determine factors associated with unmet need.

34 **Results**

35 Overall, URAS were young, less educated and living in more economically deprived households,  
36 compared with Thais. About 98% of URAS were uninsured by any of the existing health insurance  
37 schemes. The prevalence of unmet need among URAS was significantly higher than among Thais in  
38 both outpatient (OP) and inpatient (IP) services (54.1% versus 2.1% and 28.0% versus 2.1%,  
39 respectively). Being uninsured showed the strongest association with unmet need, especially for OP  
40 care. The association between insurance status and unmet need was more pronounced in the ME

41 model, relative to multivariable logistic regression. URAS migrating from Arab nations suffered  
42 from unmet need to a greater extent, compared with those originating from non-Arab nations.

### 43 **Conclusion**

44 The prevalence of unmet need in URAS was drastically high, relative to the prevalence in Thais.  
45 Factors correlated with unmet need included advanced age, lower educational achievement, and,  
46 most evidently, being uninsured. Policy makers should consider a policy option to enrol URAS in the  
47 nationwide public insurance scheme to create health security for Thai society.

### 48 **Keywords**

49 Urban refugee; asylum seeker; unmet need; healthcare; Thailand

50

51

## 52 **Background**

53 At present, cross-border mobility is a soaring global trend for many reasons, including people  
54 searching for better economic prospects, and escaping from war and political conflicts. In 2017,  
55 international cross-border populations amounted to 258 million (3.4% of global population) [1]. Of  
56 these 258 million, 68 million were forcibly displaced people. Of that 68 million, 25 million were  
57 refugees and three million were asylum seekers [2]. The situation of refugees has gained increasing  
58 attention in the global health field in recent years, particularly since the 2011 Syrian crisis which  
59 resulted in more than six million refugees fleeing from Syria to Europe [3]. Asia is another region  
60 that has encountered a refugee crisis. An obvious case is the exodus of more than 700,000 Rohingya  
61 refugees from Rakhine State in Myanmar to Bangladesh, during 2015-2017 [4].

62 The United Nations (UN) and the World Health Organization (WHO), as well as many other  
63 international development partners, have called for more concrete actions to protect refugees'  
64 rights to health and well-being. Some tangible outputs of these actions include the launch of the  
65 World Health Assembly (WHA) Resolution 70.15, entitled 'Promoting the health of refugees and  
66 migrants' [5], the New York Declaration for Refugees and Migrants [6, 7] and, recently, the Global  
67 Compact on Refugees in 2018 [8].

68 Thailand is one of the most popular destinations for international migrants and refugees in  
69 Southeast Asia. The majority of migrants are workers from Cambodia, Lao PDR, Myanmar and  
70 Vietnam (CLMV collectively). Some of them have entered the country unlawfully and are known as  
71 undocumented migrants. It is estimated that today, there are more than three million migrant  
72 workers living in Thailand [9].

73 The Thai government has implemented policies to protect the well-being of undocumented  
74 migrants for several years. One remarkable policy is the One Stop Service (OSS) registration

75 measure for undocumented CLM migrants and their dependants [10]. Migrants who register with  
76 the OSS have their profile recorded in the civil registry and acquire a work permit, alongside  
77 undertaking nationality verification (NV). The Ministry of Public Health (MOPH) also instigated a  
78 nationwide public insurance policy, called the ‘Health Insurance Card Scheme’ (HICS), for these  
79 registered migrants and their dependants. The HICS benefit is comprehensive, covering inpatient  
80 (IP) care, outpatient (OP) care, high-cost care, disease prevention and health promotion [11].

81 According to the National Security Act, all Thai nationals are covered by one of the three main  
82 public insurance arrangements: (i) Civil Servant Medical Benefit Scheme (CSMBS) for civil servants;  
83 (ii) Social Security Scheme (SSS) for employees in the formal sector; and (iii) the Universal  
84 Coverage Scheme (UCS) for those who are not covered by the CSMBS and the SSS. With the function  
85 of the HICS (for registered CLM migrants) and the insurance schemes for Thais (USMBS, SSS and  
86 UCS), Thailand (in principle) has achieved Universal Health Coverage (UHC) for almost everybody  
87 within its territory [12, 13].

88 While undocumented migrants seem to be in the spotlight of health policies in Thailand, refugees  
89 and asylum seekers are often neglected [14]. None of the aforementioned policies include refugees  
90 and asylum seekers. The situation is more complicated among refugees and asylum seekers in  
91 urban areas compared with those in temporary shelters. This is because implementing health  
92 measures in a well-defined geographical space is relatively straightforward, and local healthcare  
93 providers are well aware of the existence of refugees in the camps. Besides, the United Nations High  
94 Commissioner for Refugees ( UNHCR) and a number of international non-governmental  
95 organizations (NGOs), such as Médecins Sans Frontières and the International Rescue Committee, in  
96 coordination with public facilities along the border, have provided humanitarian assistance in the  
97 refugee camps for years [15, 16].

98 Unlike refugees in temporary shelters, urban refugees and asylum seekers (URAS) received little  
99 attention within the public health sphere in Thailand. Almost all URAS are residing in Bangkok,  
100 under the patronage of the United Nations High Commissioner for Refugees (UNHCR). So far, there  
101 are about 5,000 URAS and 97,000 refugees in temporary shelters [17, 18]. URAS are neither covered  
102 by the HICS, nor by the public insurance schemes originally designed for Thais. Nonetheless, some  
103 private facilities or insurance companies have initiated a health insurance package for URAS, which  
104 are conditional upon affordability. Some media or local NGOs suggest that URAS in Thailand face  
105 many hindrances in accessing health services, for instance, poverty, language difficulty, and  
106 precarious citizenship status [19, 20]. Moreover, some government officials are unaware of the  
107 existence of URAS [19]. Finally, there is no systematic evaluation of the degree of healthcare access  
108 for URAS in Thailand.

109 Therefore, the objective of this study is to explore the degree of healthcare access among URAS, in  
110 comparison with the Thai population. In this regard, we use 'unmet need' for health services as an  
111 indicator to gauge the ability to access health care. The concept of unmet need originates from the  
112 reproductive health field, but during the past two decades, its application has become widespread  
113 to other fields, including population health and critical care [21-23].

## 114 **Methods**

### 115 **Study design, populations and samples**

116 Both primary and secondary data collection was applied. We performed a cross-sectional survey on  
117 URAS from October to December 2019, and examined prior survey data on the Thai population  
118 through the 2019 Health Welfare Survey (HWS). HWS is a nationwide biennial survey jointly  
119 conducted by the National Statistical Office (NSO) and the International Health Policy Programme  
120 (IHPP) of the MOPH. We first contacted the Bangkok Refugee Centre (BRC), a charitable agency in  
121 collaboration with UNHCR, whose work is to support the well-being of URAS. For this study, we

122 focused on URAS of the top-ten most common nationalities in Thailand: namely, Pakistani,  
 123 Vietnamese, Cambodian, Somali, Afghan, Palestinian, Chinese, Sri Lankan, Iraqi, and Syrian,  
 124 comprising 3,021 URAS in total. We then sampled 206 URAS from the pool of 3,021 URAS in the  
 125 BRC roster (more details in ‘*Sample size calculation, sampling methods and survey design*’). Among  
 126 these 206 samples, 181 completed the survey questionnaire. Once the primary survey on URAS was  
 127 completed, we combined the data of these 181 URAS with Thai data from HWS, focusing on those  
 128 living in Bangkok (n = 2,941). The final dataset comprised 3,122 observations in total, Figure 1.

129 <<Figure 1>>

### 130 **Sample size calculation, sampling methods, and survey design**

131 We used the prevalence of unmet need for healthcare as the main indicator for sample size

132 estimation. The following formula,  $n = \frac{\left( Z_{1-\frac{\alpha}{2}} \sqrt{2PQ} + Z_{1-\beta} \sqrt{P_1 Q_1 + P_2 Q_2} \right)^2}{(P_1 - P_2)^2}$  was used; where  $\alpha = 0.05$ ;

133  $\beta = 0.2$   $Z_{1-\frac{\alpha}{2}} = 1.96$ ;  $Z_{1-\beta} = 0.84$ ;  $P_1 = 0.11$ ,  $Q_1 = 1 - P_1$ ;  $P_2 = 0.012$ ,  $Q_2 = 1 - P_2$ ;  $P = (P_1 + P_2)/2$  and  $Q =$

134  $1 - P$ .  $P_1$  refers to the unmet need prevalence in URAS whereas  $P_2$  refers to similar prevalence in the

135 Thai population. The most recent data on unmet need in Thai citizens suggested a prevalence of

136 1.2%, according to Thammatacharee et al [24]. Thus  $P_2$  was replaced by 0.012. As there has been no

137 study on unmet need among URAS in Thailand, we searched for the indicator in studies outside

138 Thailand. We found a piece of work by Busetta et al, which examined the prevalence of unmet need

139 of refugees in Italy while applying the same unmet need questions as the Thai HWS [25]. Busetta et

140 al reported that the degree of unmet need in refugees was about 11%. Hence we substituted 0.11

141 for  $P_1$ . It should be noted that both HWS and the Italian survey followed the original questions

142 proposed by the European Union Statistics on Income and Living Conditions (EU-SILC). Taking into

143 account a 20% non-response rate and incomplete information, at least 140 samples were needed in  
144 each sample group (URAS and Thais).

145 The existing records of Thai respondents in HWS already outnumbered the required number of  
146 samples; therefore no further sampling was required. For URAS, we used stratified random  
147 sampling with probability proportional to size (PPS), according to age group, sex and nationality.  
148 Fortunately, in the fieldwork, the BRC officers informed us that they were capable of recruiting 206  
149 participants. We therefore expanded the sample size to the suggested number. However, during the  
150 survey process, 23 URAS refused to take part. Of the remaining 183, two did not complete the  
151 unmet need questions. As a result, only 181 URAS were enrolled in the study. Figure 2 displays the  
152 overview of total population in each nationality from the BRC list and the actual samples acquired.  
153 Details of the sample volume tallied by age groups, nationalities, and sex can be found in  
154 Supplementary file 1.

155 <<Figure 2>>

156 <<Supplementary file 1>>

157 All selected participants were asked to travel to BRC to complete the paper questionnaire. The  
158 investigators provided financial support to cover the travelling cost of the participants (about US\$  
159 9). For those who had difficulty travelling, a phone interview was performed instead. For a child  
160 below 15 years of age, parents or legal guardians would respond on his or her behalf. The  
161 questionnaire was translated into the respondents' own language. For those who had difficulty  
162 reading, a verbal interview was performed in place of a written questionnaire. On average, each  
163 respondent took approximately thirty minutes to complete the questionnaire. A focal coordinator  
164 was prepared for each nationality group. These coordinators were volunteers working with BRC.  
165 Preparatory meeting between the research team and focal coordinators was arranged prior to the  
166 survey in order to fine-tune understanding and to assess the survey feasibility.

167 **Operational definitions**

168 We set operational definitions as follows. Firstly, 'refugee' is a person who has been forced to flee  
169 his or her country because of persecution, war or violence, and his or her request for sanctuary is  
170 ratified by the UNHCR according to the 1951 Refugee Convention [26]. Secondly, asylum seeker  
171 means someone who has been forced to flee his or her country because of persecution, war or  
172 violence and his or her request for sanctuary has yet to be processed by the UNHCR according to  
173 the 1951 Refugee Convention [26]. Lastly, unmet need refers to a status where a person reported  
174 that he or she needed health examination or treatment for any type of health issue within the past  
175 twelve months, but he or she did not receive or did not seek it. This definition is adapted from the  
176 original unmet need survey by EU-SILC [27].

177 **Questionnaire and determinants of interest**

178 The questionnaire for the URAS survey was adapted from the HWS questionnaire. Two rounds of  
179 consultative meetings between the research team, health system academics and BRC staff were  
180 arranged to ensure content validity and to make sure that the participants clearly understood the  
181 questions. The questionnaire contained two domains: (i) an individual's demography and (ii)  
182 unmet need for health services.

183 Questions about an individual's demography (1<sup>st</sup> domain) consisted of sex, age, insurance status  
184 (insured with either public or private insurance versus uninsured); education background (primary  
185 level, secondary level, and degree or above), and household monthly income. For convenience, we  
186 classified age into age groups ( $\leq 15$  years,  $>15$  but  $\leq 60$  years, and  $>60$  years) and created a new  
187 binary variable, called 'household economy', using a cut-off at 45,707 Baht (US\$ 1,428) - the  
188 average monthly income of a household in Bangkok according to the NSO [28].

189 Questions about unmet need for health services (2<sup>nd</sup> domain) asked a respondent to self-assess if,  
190 during the last twelve months, he or she had felt unwell and needed healthcare but did not receive  
191 it. These questions were sub-divided into OP care and IP care. Then, any respondent who  
192 experienced unmet need, was asked to recount the most important reason for not acquiring  
193 healthcare. Some examples of the reasons included 'cannot afford treatment cost', 'long waiting  
194 times', 'no time to seek treatment', 'too far to travel', and 'do not trust health staff'.

### 195 **Statistical analysis**

196 All statistical analyses were performed by Stata v14.0 (StataCorp LP, College Station, Texas, US—  
197 serial number: 401406358220). We divided the analysis into two parts: (i) descriptive statistics  
198 and (ii) inferential analysis. In the first part, all categorical variables were expressed as frequency  
199 and percentage. Age and household income were presented by median and interquartile range  
200 (IQR).

201 In the second part, we commenced with bivariate analysis, using Chi-square or Fisher's exact test  
202 (for categorical variables) and Mann-Whitney U test (for continuous variables), to identify: (a) the  
203 demographic difference between URAS and Thais; and (b) the relationship between unmet need  
204 and each demographic variable.

205 Further, we performed multivariable logistic regression by regressing odds of unmet need in  
206 natural logarithm scale on the selected independent variables all at once. The independent  
207 variables enrolled in this step were those exhibiting P-value of less than 0.2 in the former bivariate  
208 analysis. For a dummy variable with three or more scales (such as age group and education  
209 achievement), if there was at least a sub-scale variable showing P-value of less than 0.2 in the  
210 bivariate analysis, the variables at all scales would be included in the multivariable logistic  
211 regression.

212 We also conducted mixed-effects (ME) logistic regression, having done multivariable logistic  
213 regression at a prior stage. This time, the ME model took the nationalities of the participants into  
214 account. We categorised nationalities into three main clusters: Thai, non-Arab Asian, and Arab  
215 Asian.

216 The results were presented in terms of crude and adjusted odds ratios (OR) with 95% confidence  
217 interval (CI). Inverse probability weighting was applied when assessing statistical significance in  
218 order to take the survey design into account.

### 219 **Subgroup analysis**

220 Subgroup analysis was exercised by limiting the analysis on URAS. We then broke down the degree  
221 of unmet need by nationalities and types of URAS (urban refugee versus asylum seeker). The  
222 analysis was performed in the same fashion as the full-sample analysis.

## 223 **Results**

### 224 **Demographic profiles**

225 In total, we enrolled 3,122 records in the analysis. Of these 3,122 observations, 181 (5.8%) were  
226 URAS. Amongst 181 URAS, 160 (88.4%) were refugees and 21 (11.6%) were asylum seekers.  
227 Pakistanis constituted the largest single group of all URAS (39.8%), followed by Vietnamese  
228 (28.2%) and Cambodians (6.1%). The male to female ratio appeared to be similar in both Thais and  
229 URAS. About a third of Thai respondents had received primary education (34.6%), compared with  
230 63.5% in URAS. The median age of Thais was 42 years and almost one fifth of them fell in the  
231 elderly category. In contrast, the median age of URAS was roughly 23 years with much a smaller  
232 proportion of elderly people (6.1%). The monthly household income of Thais was, on average, five  
233 times as large as that of URAS. Almost all URAS (98.7%) had a monthly household income less than  
234 the average income of most people in Bangkok. The insurance status of Thais was also in stark

235 contrast to that of URAS. While over 99% of Thai respondents were covered by either public or  
236 private insurance, approximately 98% of URAS were completely uninsured. Only four URAS were  
237 insured, and answered in the questionnaire form that they held voluntary insurance from a private  
238 hospital in Bangkok. All of these demographic variables, except sex, yielded a statistically significant  
239 difference. Note that the number of missing data in each variable was negligible (less than 1% of the  
240 observations), except household income which appeared to be missed in over half of the samples,  
241 Table 1.

242 <<Table 1>>

### 243 **Unmet need profiles**

244 We estimated prevalence of unmet need by dividing the number of respondents who reported that  
245 they had faced unmet need in the past twelve months by the total number of respondents. The  
246 unmet need prevalence for Thais was about 2.1% in both OP and IP health services. The unmet  
247 need prevalence for URAS in IP care was approximately 28.0%, while the corresponding prevalence  
248 in OP care was 54.1%. The difference of unmet need between URAS and Thais demonstrated strong  
249 statistical significance (P-value <0.001 in both types of care), Figure 3.

250 <<Figure 3>>

### 251 **Determinants of unmet need**

252 The results in bivariate analysis and multivariable logistic regression were relatively similar. In OP  
253 care, being uninsured demonstrated a strong and significant association with unmet need (adjusted  
254 OR = 4.0 [95% CI = 1.5-10.6]). The odds of experiencing unmet need became lower among those  
255 with high education backgrounds. For instance, participants completing secondary education faced  
256 only half the odds of unmet need relative to those who completed only primary education (adjusted  
257 OR = 0.5 [95% CI = 0.2-0.9]). The likelihood of unmet need in the middle age group was about 2-3

258 times higher than for children and juveniles (crude OR = 2.7 [95% CI = 1.0-7.1;] adjusted OR = 1.9  
259 [95% CI = 1.0-3.6]). Sex and household economy did not show a significant association with unmet  
260 need. In IP care, the findings appeared to follow the same direction as OP care. The only difference  
261 was that the relationship between insurance status and unmet need turned out to be non-  
262 significant despite maintaining a positive association (adjusted OR = 1.9 [95% CI = 0.7-5.1]).

263 The findings from the ME model also demonstrated a similar pattern to results from the  
264 multivariable logistic regression, though with a marginal difference in the degree of effect size. For  
265 OP care, the adjusted OR amongst the middle age group slightly declined from 2.7 (95% CI = 1.0-  
266 7.1) in multivariable logistic regression to 1.9 (95% CI = 1.0-3.6) in the ME model, while still  
267 keeping statistical significance (P-value = 0.049 in multivariable logistic regression and 0.041 in the  
268 ME model). The models showed almost similar results. The most noticeable difference was the  
269 adjusted OR of the insurance variable in the ME model, which expanded about three to four times,  
270 relative to the ratio in multivariable logistic regression (adjusted OR = 14.5 [95% CI = 2.6-84.1] for  
271 OP care; and adjusted OR = 10.4 [95% CI = 1.9-55.6] for IP care). Statistically significant  
272 relationship between insurance status and unmet need was observed for both types of care (P-  
273 value = 0.003 for OP care, and 0.006 for IP care), Tables 2-3.

274 <<Table 2>>

275 <<Table 3>>

276 Among the 98 URAS who reported unmet need for OP care, 94 (95.9%) ascribed the inaccessibility  
277 of health services to unaffordable treatment cost. The remaining four URAS raised other reasons,  
278 such as language barriers, and a fear of being arrested by the police. Of the 61 Thais who reported  
279 unmet need for IP care, 38 (62.3%) pointed towards long waiting times as the most important  
280 cause for inaccessibility. The second most important reason was dissatisfaction with the facility's

281 performance (11.5%). The most important reason raised for inaccessible IP care was very close to  
282 that for OP care: 'lack of money' in 93.9% of URAS and 'long waiting times' in 62.3% of Thais.

### 283 **Subgroup analysis**

284 Subgroup analysis found that, for OP care, the proportion of urban refugees facing unmet need  
285 (55.0%) was slightly larger than the corresponding proportion amongst asylum seekers (47.6%).  
286 For IP care, about one third of the participants experienced unmet need (27.1% for urban refugees  
287 and 35.0% for asylum seekers). No statistical significance difference was observed in either type of  
288 care when comparing urban refugees with asylum seekers (P-value = 0.523 for OP care and 0.459  
289 for IP care), Figure 4.

290 <<Figure 4>>

291 Afghans, Iraqis, and Palestinians were the populations with the greatest degree of unmet need  
292 (85.7-100.0% in OP care and 71.4-83.3% in IP care). In contrast, URAS from Cambodia and Vietnam  
293 showed the smallest unmet need estimate (31.4-33.3% in OP care and 9.1-13.7% in IP care), in  
294 relation to other nationals, Figure 5.

295 <<Figure 5>>

### 296 **Discussion**

297 To our knowledge, this piece of work is among the first few studies in Asia that quantitatively  
298 investigate the degree of healthcare access among URAS through the perspective of unmet need.  
299 From a macro-perspective, demographic data showed that most URAS were relatively younger,  
300 were less educated, and were living in more economically deprived households.

301 The evidence from this study suggests that about one fifth to one quarter of URAS faced unmet need  
302 for health services while the prevalence of unmet need in the Thai population was very small. This  
303 is not surprising; but a more interesting point is whether the degree of unmet need in URAS was  
304 larger than for other types of refugees or non-Thai populations. Unfortunately, we could not find

305 peer-review studies on unmet need amongst any kinds of refugees in Thailand, published in the last  
306 decade. The only evidence we could identify is a study by Thein and Theptien, which reported that  
307 the prevalence for access to family planning amongst Myanmar migrant women in Bangkok was  
308 15.8% [29]. This figure was still far lower than the prevalence found in our study (28.0% for IP care  
309 and 54.1% for OP care). Hence it is not an exaggeration to state that URAS are one of the most  
310 vulnerable groups in Thailand, even among non-Thais populations, let alone when compared with  
311 Thai citizens.

312 Determinants that potentially contributed to unmet need included increasing age, less education,  
313 and, most prominently, the lack of health insurance. This finding is in line with those from some  
314 other studies. Wang et al suggested that more education was negatively associated with unmet  
315 need for supportive care among Chinese women [30]. Hailemariam and Haddis also flagged that  
316 low levels of education resulted in increasing degrees of unmet need for family planning in the  
317 Ethiopian population [31]. Bhattathiry and Ethirajan reported that unmet need for family planning  
318 decreased as age advanced [32]. This finding contradicts our discovery, which found that people  
319 with advanced age were more likely to have unmet need than those in lower age groups. Some of  
320 the explanations for this phenomenon is, first, the difference in the care of interest between our  
321 survey (focusing on IP and OP care in general) and Bhattathiry and Ethirajan's survey (focusing  
322 only on family planning); and second, the in-house intervention of BRC.

323 Based on our discussion with BRC staff, we found that BRC had created its own supportive  
324 measures for URAS by allowing children up to five years of age to enjoy free healthcare at public  
325 facilities. Parents of these children could be reimbursed for the full healthcare cost from BRC if their  
326 children visited a health facility. This might be a reason why our findings suggest a negative  
327 association between age and unmet need. Furthermore, BRC also offered partial financial support  
328 for URAS who were admitted to a public hospital. The authority pledged to subsidise the cost of IP  
329 care for URAS up to 20,000 Baht (US\$ 625) per visit. This initiative might explain why being

330 uninsured showed significant association with unmet need for OP care, but not for IP care, in  
331 multivariable logistic regression. It is worth noting that these in-house policies have not been  
332 systematically managed as an insurance scheme and still function as charitable activities,  
333 depending on financial resources of the organisation and ad hoc negotiation with the healthcare  
334 providers.

335 Another interesting point from our findings was that insurance status appeared to be the most  
336 influential determinant of unmet need. The multivariable logistic regression indicated that the risk  
337 of facing unmet need for OP health services in the uninsured was about four-times as large as the  
338 risk in the insured. The degree of association became much stronger (approximately 15 times for  
339 OP care and 10 times for IP care) when applying the ME model. As, so far, there is no public  
340 insurance policy for URAS, it is not surprising that the prevalence of unmet need in URAS was  
341 staggering. This finding also corresponds with the fact that the majority of URAS pointed towards  
342 financial difficulties to afford the treatment cost as the most important concern. In other words,  
343 URAS are at huge risk of impoverishment at any time when they seek treatment, and it means that  
344 Thailand has not yet achieved UHC for everybody in its territories, as intended [33]. Since the  
345 concept of UHC covers not only the provision of essential quality health services, but also the  
346 prevention of impoverishment from healthcare spending, the issue of URAS accessing health care  
347 has considerable policy implications. Thailand is committed to the Sustainable Development Goals  
348 (SDG), including SDG target 3.8, which focuses on UHC [34]; therefore policies to enrol URAS in a  
349 public health insurance scheme should be seriously considered. In addition, leaving URAS  
350 uninsured potentially results in low access to essential healthcare, and this may undermine the  
351 health security of Thai society as a whole. Experiences from other countries that offer health  
352 insurance for URAS, such as Iran and Malaysia, are of great value and warrant further exploration  
353 [35, 36].

354 As Thailand is not a party to the 1951 Refugee Convention [37], the Thai government is neither  
355 obliged to guarantee any health measures for urban refugees, nor for asylum seekers whose  
356 application for refugee status is still in process. The subgroup analysis reflected this fact, showing  
357 no significant difference in the unmet need for healthcare in urban refugees, relative to asylum  
358 seekers.

359 Despite not being a primary objective of the study, the varying degree of unmet need among diverse  
360 national groups was thought-provoking. This was evidenced by the fact that the adjusted OR in the  
361 ME model, which had already considered the clustering effect of nationalities on unmet need,  
362 greatly expanded, compared with the ratio in the multivariable logistic regression, which assumed  
363 no correlation between observations.

364 The descriptive subgroup analysis also showed that Cambodian and Vietnamese URAS suffered  
365 least from unmet need, compared with other nationals. A possible explanation is that URAS from  
366 Southeast Asia nations may have lifestyle and beliefs close to Thais (including the Buddhist belief);  
367 and that Thai society is already acquainted with migrants travelling from neighbouring countries  
368 (especially from CLMV nations). In contrast, URAS from Arab nations (for instance, Iraqis,  
369 Palestinians and Syrians) presented a relatively large degree of unmet need. As Arab people are the  
370 minority in Bangkok, they possibly need a huge adaptation to incorporate the Arab way of life to  
371 South East Asian culture. This picture alludes to the concept of acculturation proposed by a great  
372 deal of prior research [38-40]. That is, refugees who can assimilate or integrate themselves into a  
373 new culture tend to have better health outcomes, compared with the poorly adjusted ones [38-40].  
374 However, a thorough qualitative study or ethnographic research is needed to prove this  
375 presumption.

376 The methodology of this study bears some strengths and limitations. Regarding strengths, the study  
377 employed a systematic approach for data sampling, and we recruited participants from a household  
378 level, even though there were no physical visits to the participants' households. Another strength of

379 the study is the use of Thai respondent data as a comparator. We would not have a clear view on the  
380 extent of unmet need for health services in URAS had the comparator (HWS data) been missing.  
381 However, there remain some limitations. Firstly, as the nationalities of URAS are vastly diverse, we  
382 could not guarantee a perfect translation of the questionnaire. This problem would rarely occur in  
383 the HWS questionnaire as Thai is the only formal language for Thai citizens. Nonetheless, we tried  
384 to minimize language barriers by arranging a training workshop for the survey volunteers to  
385 achieve mutual understanding between the volunteers and the research team. These volunteers  
386 mostly worked with BRC and some of them were also URAS.

387 Secondly, the unmet need question inquired about a history of healthcare access in the past twelve  
388 months, and therefore a recall bias was inevitable. This problem might not severely undermine the  
389 validity of the analysis as the bias could be present in both the URAS survey and the HWS. However,  
390 the bias might be more pronounced in the URAS survey compared with the HWS, because of the  
391 difference in survey practice. In our URAS survey, when we recruited people with difficulties  
392 travelling, we asked a surrogate respondent to answer the questionnaire on their behalf. In  
393 contrast, the HWS surveyors always visited the participants at their households, resulting in a  
394 lower reliance on surrogate respondents in comparison with the survey on URAS.

395 Thirdly, as mentioned earlier, we did not perform a physical visit to the participants' households.  
396 This is because many URAS had precarious immigration status. Some of them were over-stayers. A  
397 physical visit meant that they needed to disclose their residential address to the surveyors. This  
398 issue was thoroughly discussed with the ethics committee and the BRC staff before the start of the  
399 fieldwork. With this limitation, some key household information that necessitates direct  
400 observation, such as household infrastructure and owner's equity, was missing. Such information  
401 serves as the main ingredient for estimating household prosperity through the indicator called  
402 'asset index' [41]. The lack of this indicator, in combination with a fair amount of missing data on  
403 household economy, might explain why the economic wealth of URAS did not exhibit a statistically

404 significant relationship with unmet need, although the direction of effect implied that the less  
405 affluent participants tended to face greater odds of unmet need, compared with the well-off group.  
406 The original HWS questionnaire contains questions about household properties, and the surveyors  
407 were able to use the answers from these questions to estimate asset index. However, we dropped  
408 such questions in the questionnaire for URAS after we decided not to perform a physical visit to  
409 URAS households.

410 Fourthly, though the URAS survey and HWS followed the same set of questions, the timeline for  
411 conducting both surveys and human resources used were different. Therefore a direct comparison  
412 between URAS and Thais should take into account this limitation.

413 Fifthly, as per the intrinsic nature of cross-sectional design, it is difficult to identify causal  
414 relationship between unmet need and the selected independent variables. A cohort-based survey  
415 on URAS is recommended; but this requires the establishment of a system to regularly monitor  
416 health status of URAS over the long term. The system cannot be set up without collaboration  
417 amongst all concerned parties, especially the Thai government, NGOs, and the UNHCR. This raises a  
418 key issue mentioned earlier; whether the Thai government views URAS as a population it needs to  
419 take care of.

420 Sixthly, this study is not free from data bias, as some determinants between URAS and Thais were in  
421 stark contrast. The insurance variable was a clear example in this case. We found that less than 1%  
422 of the Thai participants were uninsured. In contrast, only 2.2% of URAS held some kind of health  
423 insurance. The lack of adequate case numbers for some combinations of exposure and outcome  
424 levels may cause an upward bias away from the null for the effect estimates [42]. This problem  
425 might also occur in other variables aside from insurance status, such as age groups and household  
426 prosperity. A more delicate analysis method, such as penalised regression, should be considered in  
427 further studies if the problem of sparse data appears again.

428 Lastly, the people of interest in this study were those presenting on the BRC roster only, not all  
429 URAS in Bangkok. We did not include URAS in non-household settings, such as shelters or detention  
430 centres. This definitely limits the generalisability power of our study. To expand the academic  
431 richness in this field, further studies on other types of refugees are strongly recommended.

## 432 **Conclusion**

433 Overall, URAS had lower educational attainment and faced more severe financial hardship than  
434 Thais. The prevalence of unmet need in URAS was extremely high, relative to the corresponding  
435 prevalence in Thais. Factors that suggested a positive relationship with unmet need included  
436 advanced age, lower educational achievement, and, most evidently, being uninsured. All relevant  
437 parties, such as policy makers, academics and high-level bureaucrats in the public health area,  
438 should consider measures to include URAS in some kind of nationwide public insurance. The  
439 benefit of this is to alleviate unmet need for health services in URAS, but also to strengthen health  
440 security for Thai society as a whole. Additional studies on the health status and access to healthcare  
441 of other types of refugees are also recommended.

442

## 443 **List of abbreviations**

BRC = Bangkok Refugee Centre

CLM = Cambodia, Lao PDR and Myanmar

CI = Confidence interval

CSMBS = Civil Servant Medical Benefit Scheme

EU-SILC = European Union Statistics on Income and Living Conditions

HICS = Health Insurance Card Scheme

IHPP = International Health Policy Programme

IP = Inpatient

ME = Mixed-Effects

MOPH = Ministry of Public Health

NGO = Non-government Organisation

NV = Nationality Verification

OP = Outpatient

OR = Odds Ratio

OSS = One Stop Service

PPS = Probability Proportional to Size

SSS = Social Security Scheme

UHC = Universal Health Coverage

UNHCR = United Nations High Commissioner for Refugees

UN = United Nations

URAS = Urban Refugee and Asylum Seeker

WHA = World Health Assembly

WHO= World Health Organization

## Declarations

- **Ethics approval and consent to participate**

This study obtained ethics approval from the Institute for the Development of Human Research Protections (IHRP)—letter head: IHRP 592/2562. Written consent was obtained from the participants. For those uncomfortable with providing written consent, verbal consent was used instead. All respondents were assured that their participation was voluntary and they had the right to withdraw from the survey at any time. All individual information was kept strictly confidential and would not be reported to the wider public.

- **Consent to publish**

Not applicable

- **Availability of data and materials**

The raw data used by this study jointly belonged to BRC and IHPP. The analysed data are however available from the authors upon reasonable request.

- **Competing interests**

The authors declare no conflict of interest.

- **Funding**

This study received funding support from the Health Systems Research Institute, Thailand.

- **Author contributions**

Conceptualization, RS, NP and PT; Methodology, RS and PT; Validation, RS and WK; Formal analysis, RS, WK and MP; Investigation, RS, WK, and MP; Resources, RS, PS and SJ; Data collection, RS, PS, MP, NP, SJ, and WK; Data management, PS, MP, SJ and WK; Project administration, PS and SJ; Writing—Original draft, RS; Writing—review and editing, RS, PS, MP, NP, SJ, WK and PT. All authors have read and approved the final manuscript.

- **Acknowledgements**

We are immensely grateful for the support from BRC, IHPP and UNHCR during the survey process.

Advice from Ms Bongkot Napaumporn and Dr Herve Isambert is hugely appreciated.

**Figure 1:** Population frames, samples and data sources

**Figure 2:** Number of samples participating in the survey sorted by nationalities

**Figure 3:** Prevalence of unmet need in Thais *versus* urban refugees and asylum seekers

Note: URAS = urban refugee and asylum seeker

**Figure 4:** Prevalence of unmet need in urban refugees versus asylum seekers

**Figure 5:** Prevalence of unmet need by nationalities

**Table 1:** Demographic characteristics of the participants<sup>§</sup>

Variable	Thai (n=2941)	URAS <sup>‡</sup> (n=181)	P-value	Test
Sex—n (%)			0.975	Chi-square
• Female	1,550 (52.7)	95 (52.5)		
• Male	1,391 (47.3)	86 (47.5)		
Education—n (%)			<0.001	Chi-square
• Up to primary	981 (34.6)	115 (63.5)		
• Up to secondary	1,091 (38.5)	46 (25.4)		
• Degree or above	765 (26.9)	20 (11.1)		
Median age—years (IQR) <sup>#</sup>	42.0 (31.0)	23.1 (27.3)	<0.001	Mann-Whitney U
Age group—n (%)			<0.001	Chi-square
• ≤15 years	349 (11.9)	68 (37.6)		
• >15 but ≤60 years	2,033 (69.1)	102 (56.3)		
• >60 years	599 (19.0)	11 (6.1)		
Median household income—Baht (IQR)	30,000 (30,000)	6,000 (4,500)	<0.001	Mann-Whitney U
Household economy			<0.001	Fisher's exact
• Above average	271 (23.9)	2 (1.3)		
• Below average	861 (76.1)	151 (98.7)		
Insurance status			<0.001	Fisher's exact
• Uninsured	6 (0.2)	177 (97.8)		
• Insured	2,935 (99.8)	4 (2.2)		

Note: <sup>§</sup>Missing data were not included in the table; <sup>‡</sup>Urban refugee and asylum seekers; <sup>#</sup>Interquartile range

**Table 2:** Factors associated with unmet need for outpatient care

Factors	Bivariate analysis by Chi square test		Multivariable logistic regression		Mixed-effects model	
	Crude OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
Uninsured (v insured)	4.0 (1.6-9.7)	0.003	4.0 (1.5-10.6)	0.005	14.7 (2.6-84.1)	0.003
Male (v female)	1.5 (0.8-2.6)	0.163	1.5 (0.9-2.7)	0.136	1.1 (0.7-1.6)	0.770
Age group (v ≤15 years)						
• >15 but ≤60 years	2.6 (1.1-6.1)	0.031	2.7 (1.0-7.1)	0.049	1.9 (1.0-3.6)	0.041
• > 60 years	1.8 (0.6-5.1)	0.268	1.3 (0.5-3.8)	0.615	1.4 (0.7-3.1)	0.538
Education level (v primary education)						
• Secondary education	0.7 (0.3-1.3)	0.211	0.5 (0.2-0.9)	0.047	0.6 (0.3-1.0)	0.032
• Degree of above	0.4 (0.2-0.9)	0.024	0.3 (0.1-0.7)	0.005	1.0 (0.6-1.7)	0.881
Below-average economic level (v above average)	1.6 (0.7-4.0)	0.286	-	-	-	-

**Table 3:** Factors associated with unmet need for inpatient care

Factors	Bivariate analysis by Chi square test		Multivariable logistic regression		Mixed-effects model	
	Crude OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
Uninsured (v insured)	1.9 (0.8-4.7)	0.155	1.9 (0.7-5.1)	0.200	10.4 (1.9-55.6)	0.006
Male (v female)	1.5 (0.8-2.6)	0.165	1.5 (0.9-2.7)	0.144	1.0 (0.7-1.5)	0.950
Age group (v ≤15 years)						
• >15 but ≤60 years	2.6 (1.1-6.4)	0.030	2.7 (1.0-7.4)	0.047	1.4 (0.7-2.7)	0.321
• > 60 years	1.8 (0.6-5.3)	0.264	1.3 (0.5-3.9)	0.591	0.9 (0.4-2.0)	0.803
Education level (v primary education)						
• Secondary education	0.7 (0.3-1.3)	0.217	0.5 (0.2-1.0)	0.047	0.6 (0.3-1.0)	0.055
• Degree of above	0.4 (0.2-0.9)	0.025	0.3 (0.1-0.7)	0.005	0.9 (0.5-1.6)	0.766
Below-average economic level (v above average)	1.6 (0.7-3.9)	0.297	-	-	-	-

## References

1. United Nations. International Migration Report 2017 Highlights (ST/ESA/SER.A/404) [Internet]. New York: United Nations; 2017 [cited 20 December 2018]; Available from: [http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017\\_Highlights.pdf](http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf).
2. UNHCR. Figures at a glance: statistical yearbooks [Internet]. Geneva: UNHCR; 2018 [cited 13 June 2019]; Available from: <https://www.unhcr.org/figures-at-a-glance.html>.
3. World Vision. Syrian refugee crisis: Facts, FAQs, and how to help [Internet]. Washington: World Vision; 2019 [cited 13 June 2019]; Available from: <https://www.worldvision.org/refugees-news-stories/syrian-refugee-crisis-facts>.
4. European Commission. The Rohingya Crisis: ECHO Factsheet [Internet]. Brussels: European Commission; 2018 [cited 17 June 2019]; Available from: [http://ec.europa.eu/echo/files/aid/countries/factsheets/rohingya\\_en.pdf](http://ec.europa.eu/echo/files/aid/countries/factsheets/rohingya_en.pdf).
5. World Health Organization. Promoting the health of refugees and migrants. Seventieth World Health Assembly Resolution WHA70.15, 31 May 2017 [Internet]. Geneva: World Health Organization; 2017 [cited 20 December 2018]; Available from: [www.who.int/migrants/about/A70\\_R15-en.pdf](http://www.who.int/migrants/about/A70_R15-en.pdf).
6. UNHCR. New York Declaration for Refugees and Migrants [Internet]. New York: UNHCR; 2019 [cited Available from: <https://www.unhcr.org/new-york-declaration-for-refugees-and-migrants.html>].
7. United Nations. Global compact for migration [Internet]. New York: United Nations; 2018 [cited 20 December 2018]; Available from: <https://refugeesmigrants.un.org/migration-compact>.

8. United Nations. Global compact on refugees [Internet]. New York: United Nations; 2018 [cited 10 May 2020]; Available from: <https://www.unhcr.org/5c658aed4.pdf>.
9. International Organization for Migration. Thailand Migration Report 2019 [Internet]. Bangkok: IOM; 2019 [cited 27 January 2019]; Available from: <https://thailand.iom.int/thailand-migration-report-2019-0>.
10. Suphanchaimat R, Putthasri W, Prakongsai P, Tangcharoensathien V: Evolution and complexity of government policies to protect the health of undocumented/illegal migrants in Thailand - the unsolved challenges. *Risk Manag Healthc Policy* 2017, 10:49-62.
11. Health Insurance Group: Health Card for Uninsured Foreigners and Health Card for Mother and Child. In: *Seminar on measures and protocols of medical examination, insuring migrants and protecting maternal and child health*. Best Western Grand Howard Hotel, Bangkok: Office of the Permanent Secretary, Ministry of Public Health; 2013.
12. Towse A, Mills A, Tangcharoensathien V: Learning from Thailand's health reforms. *BMJ* 2004, 328(7431):103-105.
13. Kantamaturapoj K, Kulthanmanusorn A, Witthayapipopsakul W, Viriyathorn S, Patcharanarumol W, Kanchanachitra C, Wibulpolprasert S, Tangcharoensathien V: Legislating for public accountability in universal health coverage, Thailand. *Bull World Health Organ* 2020, 98(2):117-125.
14. Posttoday Online. Refugees from 40 countries flee to the urban area: a hope for survival [Internet]. Bangkok: Posttoday Online; [cited 17 June 2019]; Available from: <https://www.posttoday.com/politic/report/499494>.
15. Alexakis LC, Athanasiou M, Konstantinou A: Refugee camp health services utilisation by non-camp residents as an indicator of unaddressed health needs of surrounding populations: a perspective from Mae La refugee camp in Thailand during 2006 and 2007. *Pan Afr Med J* 2019, 32:188-188.

16. Plewes K, Lee T, Kajeechewa L, Thwin MM, Lee SJ, Carrara VI, Nosten F, McGready R: Low seroprevalence of HIV and syphilis in pregnant women in refugee camps on the Thai-Burma border. *Int J STD AIDS* 2008, 19(12):833-837.
17. UNHCR. Thailand Factsheet [Internet]. Bangkok: UNHCR; 2016 [cited 17 June 2019]; Available from: <https://www.unhcr.org/50001e019.pdf>.
18. Office of Foreign Workers Administration. Statistics of remaining cross-border migrants holding work permit in Thailand as of October 2018 [Internet]. Department of Employment, Ministry of Labour 2018 [cited 18 December 2018]; Available from: [https://www.doe.go.th/prd/assets/upload/files/alien\\_th/98802fed607243cb1c1afe248b3d29eb.pdf](https://www.doe.go.th/prd/assets/upload/files/alien_th/98802fed607243cb1c1afe248b3d29eb.pdf).
19. Kangkun P. Life in limbo for Thailand's urban refugees [Internet]. Bangkok: Nation Thailand; 2018 [cited 10 May 2020]; Available from: <https://www.nationthailand.com/opinion/30355070>.
20. Quinley C. Life in the shadows: Thailand's urban refugees [Internet]. Geneva: The New Humanitarian; 2019 [cited 10 May 2020]; Available from: <https://www.thenewhumanitarian.org/news/2019/09/11/Thailand-refugee-policies-asylum-seekers-immigration-detention>.
21. Bradley SEK, Casterline JB: Understanding unmet need: history, theory, and measurement. *Stud Fam Plann* 2014, 45(2):123-150.
22. Dixon-mueller R, Germain A: Unmet need from a woman's health perspective. *Plan Parent Chall* 1994(1):9-12.
23. Newell CP, Wallis S, Botting N, Sajdler C, Foo A, Bourdeaux C: Unmet need for critical care on the wards - how many critically ill patients are really out there? *Intensive Care Med Exp* 2015, 3(Suppl 1):A470.

24. Thammatacharee N, Tisayaticom K, Suphanchaimat R, Limwattananon S, Putthasri W, Netsaengtip R, Tangcharoensathien V: Prevalence and profiles of unmet healthcare need in Thailand. *BMC Public Health* 2012, 12(1):923.
25. Busetta A, Cetorelli V, Wilson B: A Universal Health Care System? Unmet Need for Medical Care Among Regular and Irregular Immigrants in Italy. *J Immigr Minor Health* 2018, 20(2):416-421.
26. UNHCR. What is a refugee? [Internet]. Washington, DC: UNHCR; 2018 [cited 18 June 2019]; Available from: <https://www.unrefugees.org/refugee-facts/what-is-a-refugee/>.
27. Hernández-Quevedo C, Masseria C, Mossialos E: Methodological issues in the analysis of the socioeconomic determinants of health using EU-SILC data. In. Luxembourg: Publications Office of the European Union; 2010.
28. National Statistical Office. Revenue and Household Expenditure [Internet]. Bangkok: NSO; 2020 [cited 18 May 2020]; Available from: <http://statbbi.nso.go.th/staticreport/page/sector/th/08.aspx>.
29. Thein SS, Thepthien B-o: Unmet need for family planning among Myanmar migrant women in Bangkok, Thailand. *British Journal of Midwifery* 2020, 28(3):182-193.
30. Wang S, Li Y, Li C, Qiao Y, He S: Distribution and Determinants of Unmet Need for Supportive Care Among Women with Breast Cancer in China. *Med Sci Monit* 2018, 24:1680-1687.
31. Hailemariam A, Haddis F: Factors affecting unmet need for family planning in southern nations, nationalities and peoples region, ethiopia. *Ethiop J Health Sci* 2011, 21(2):77-89.
32. Bhattathiry MM, Ethirajan N: Unmet need for family planning among married women of reproductive age group in urban Tamil Nadu. *J Family Community Med* 2014, 21(1):53-57.
33. National Health Security Office. NHSO Vision/Mission [Internet]. Bangkok: NHSO; 2020 [cited 22 May 2020]; Available from: [http://eng.nhso.go.th/view/1/Vision\\_Mission/EN-US](http://eng.nhso.go.th/view/1/Vision_Mission/EN-US).

34. Witthayapipopsakul W, Kulthanmanusorn A, Vongmongkol V, Viriyathorn S, Wanwong Y, Tangcharoensathien V: Achieving the targets for universal health coverage: how is Thailand monitoring progress? *WHO South-East Asia J Public Health* 2019, 8:10-17.
35. Matlin SA, Depoux A, Schütte S, Flahault A, Saso L: Migrants' and refugees' health: towards an agenda of solutions. *Public Health Rev* 2018, 39:27.
36. Chuah FLH, Tan ST, Yeo J, Legido-Quigley H: Health System Responses to the Health Needs of Refugees and Asylum-seekers in Malaysia: A Qualitative Study. *International journal of environmental research and public health* 2019, 16(9):1584.
37. UNHCR. States Parties to the 1951 Convention relating to the Status of Refugees and the 1967 Protocol [Internet]. Geneva: UNHCR; 1967 [cited 23 May 2020]; Available from: <https://www.unhcr.org/protection/basic/3b73b0d63/states-parties-1951-convention-its-1967-protocol.html>.
38. Schwartz SJ, Unger JB, Zamboanga BL, Szapocznik J: Rethinking the concept of acculturation: implications for theory and research. *Am Psychol* 2010, 65(4):237-251.
39. Lincoln AK, Lazarevic V, White MT, Ellis BH: The Impact of Acculturation Style and Acculturative Hassles on the Mental Health of Somali Adolescent Refugees. *J Immigr Minor Health* 2016, 18(4):771-778.
40. Young M: [Acculturation, identity and well-being: the adjustment of Somalian refugees]. *Sante Ment Que* 1996, 21(1):271-290.
41. Sartipi M, Nedjat S, Mansournia MA, Baigi V, Fotouhi A: Assets as a Socioeconomic Status Index: Categorical Principal Components Analysis vs. Latent Class Analysis. *Arch Iran Med* 2016, 19(11):791-796.
42. Greenland S, Mansournia MA, Altman DG: Sparse data bias: a problem hiding in plain sight. *BMJ* 2016, 352:i1981.

# Figures

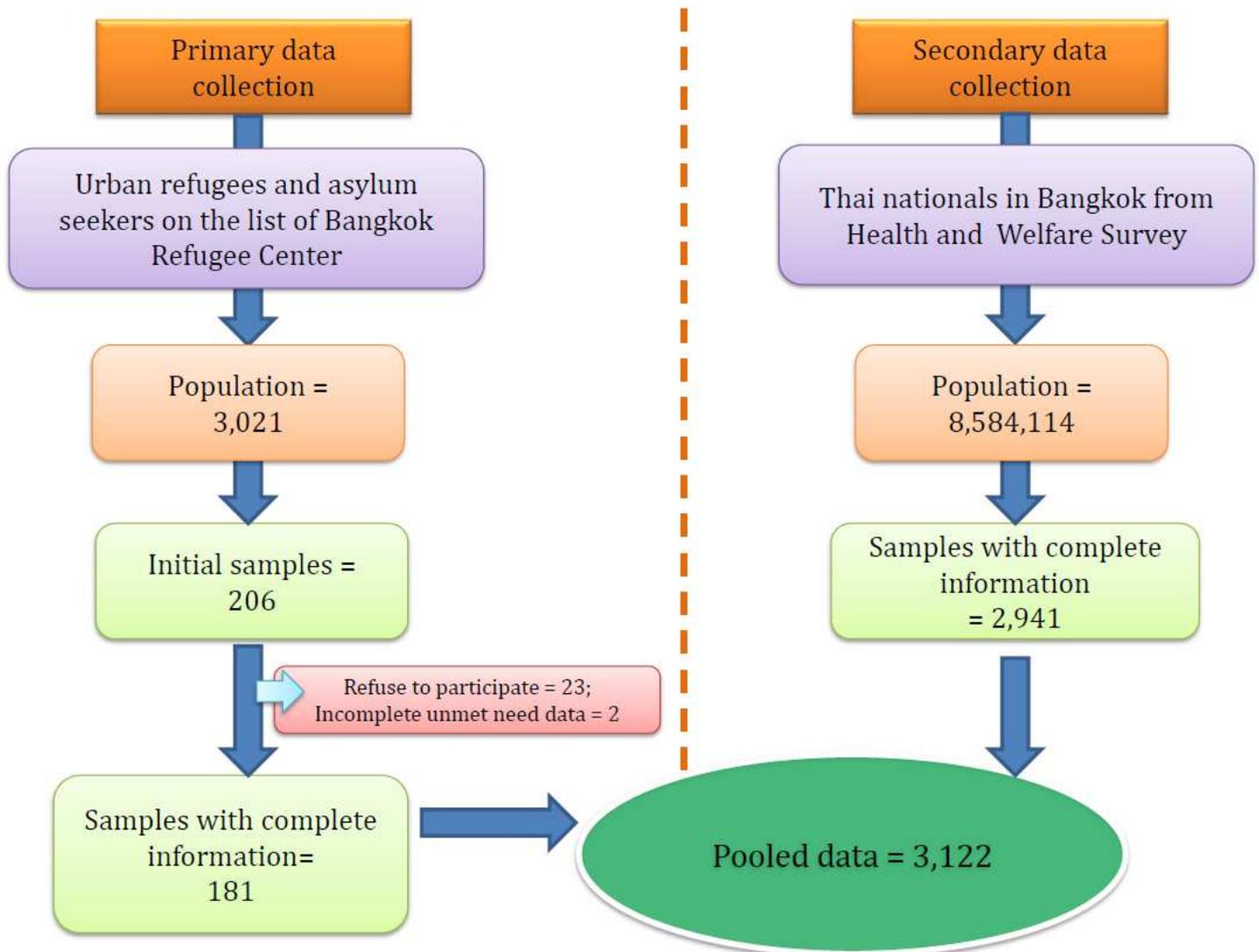


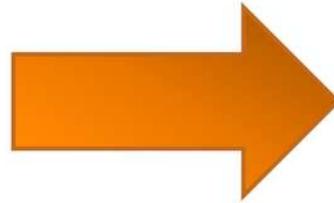
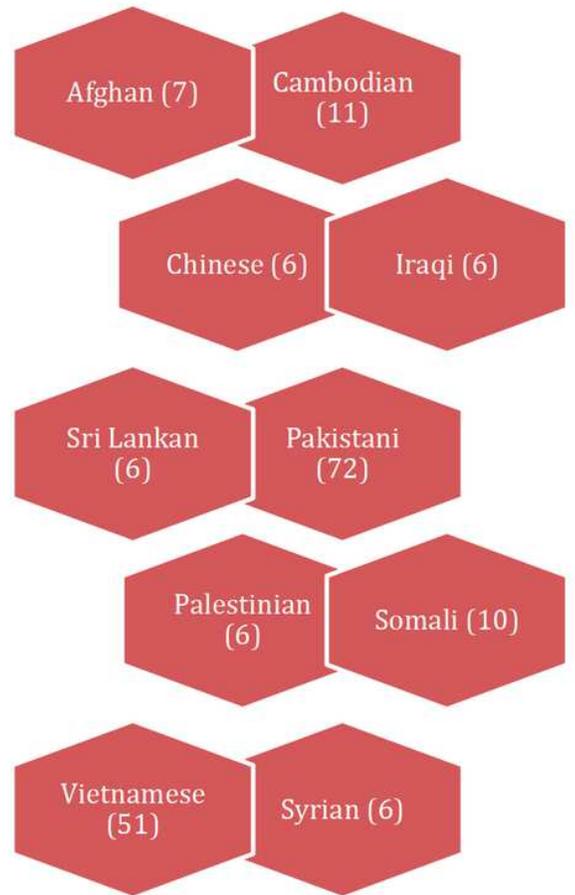
Figure 1

Population frames, samples and data sources

## Population in Bangkok Refugee Center



## Samples acquired

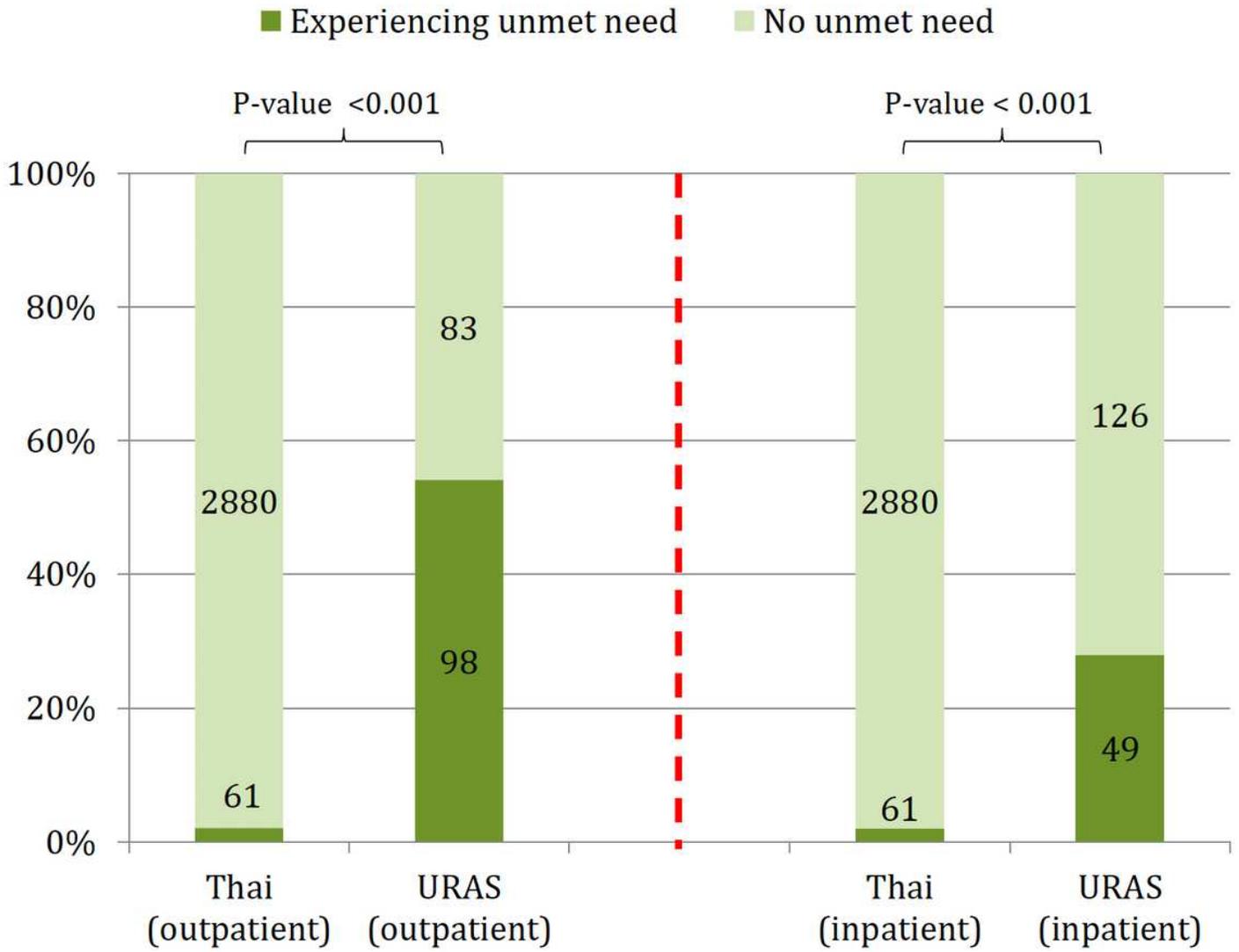


Sampling with probability proportional to size by

- age groups (0-15 y = 1,262; >15 y = 1,759) and
- sex (male = 1,556; female = 1,465)

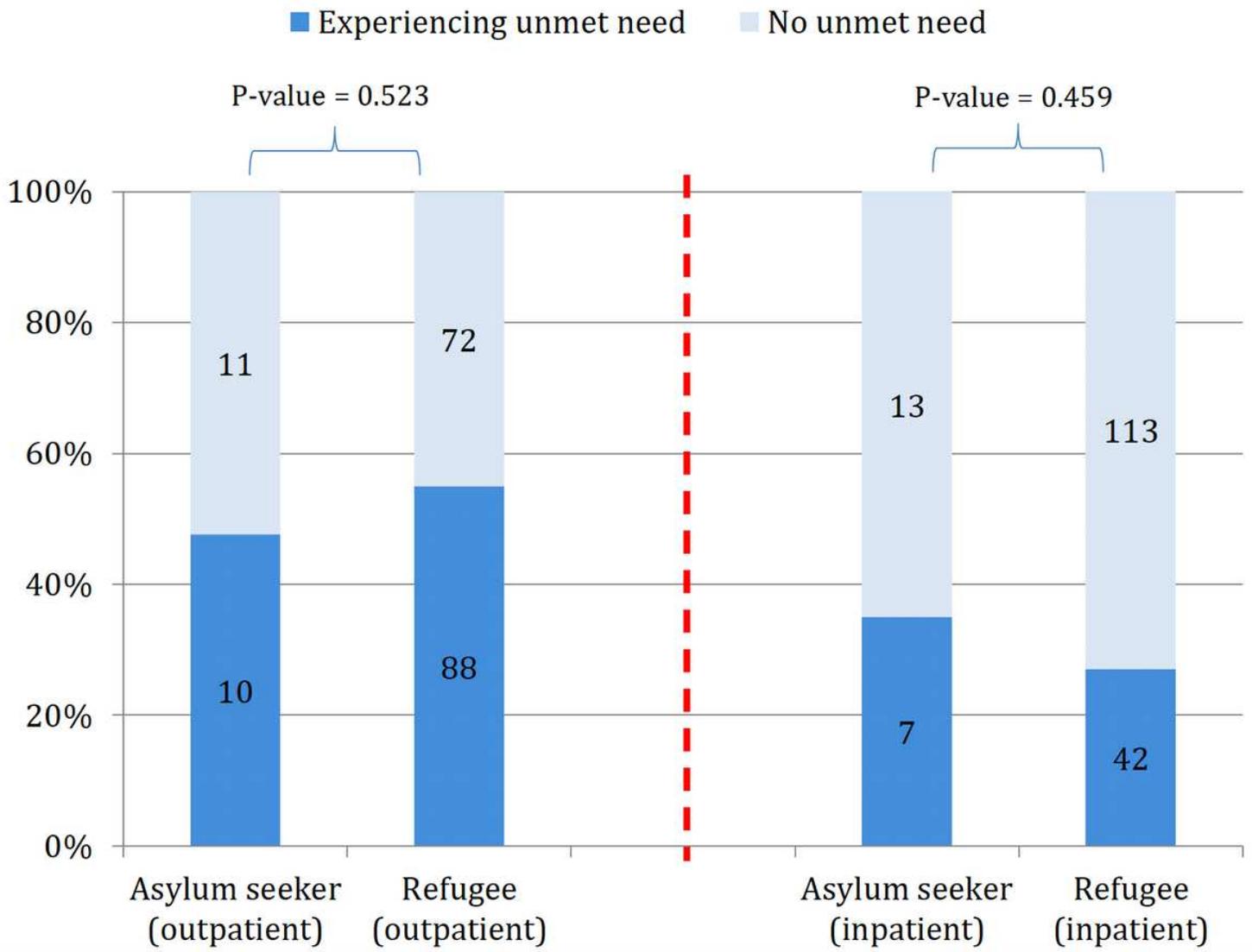
**Figure 2**

Number of samples participating in the survey sorted by nationalities



**Figure 3**

Prevalence of unmet need in Thais versus urban refugees and asylum seekers Note: URAS = urban refugee and asylum seeker



**Figure 4**

Prevalence of unmet need in urban refugees versus asylum seekers

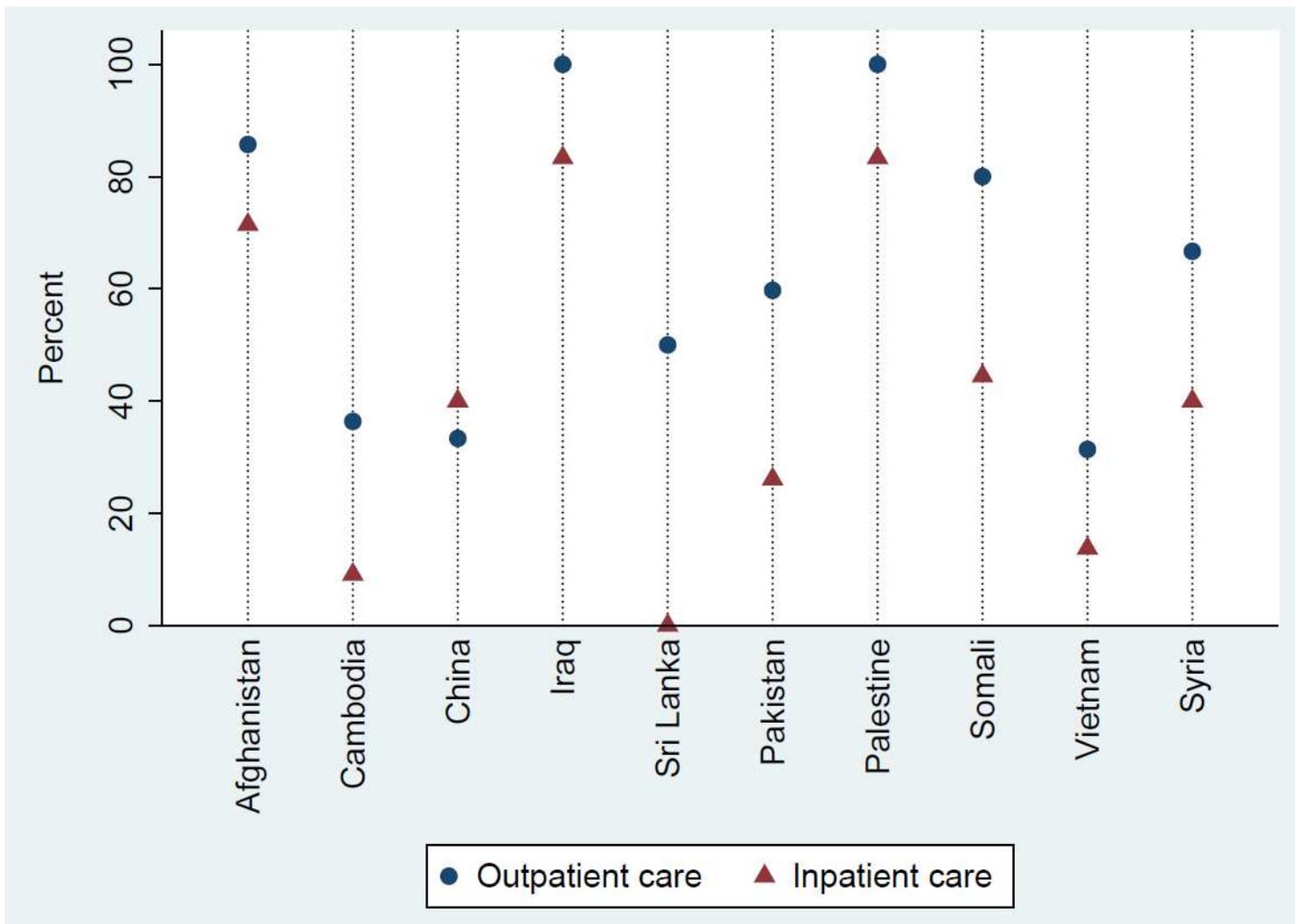


Figure 5

Prevalence of unmet need by nationalities

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Supplementaryfile1UPDATE.pdf](#)