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1 **Equitable access to health insurance for socially excluded children? The**

2 **case of the National Health Insurance Scheme in Ghana**

3 Abstract

4

5 To help reduce child mortality and reach universal health coverage, Ghana extended free

6 membership of the National Health Insurance Scheme (NHIS) to children (under-18s) in

7 2008. However, despite the introduction of premium waivers, a substantial proportion of

8 children remain uninsured. Thus far, few studies have explored why enrolment of

9 children in NHIS may remain low, despite the absence of significant financial barriers to

10 membership. In this paper we therefore look beyond economic explanations of access to

11 health insurance to explore additional wider determinants of enrolment in the NHIS. In

12 particular, we investigate whether social exclusion, as measured through a sociocultural,

13 political and economic lens, can explain poor enrolment rates of children. Data were

14 collected from a cross-sectional survey of 4050 representative households conducted in

15 Ghana in 2012. Household indices were created to measure sociocultural, political and

16 economic exclusion, and logistic regressions were conducted to study determinants of

17 enrolment at the individual and household levels. Our results indicate that socioculturally,

18 economically and politically excluded children are less likely to enrol in the NHIS.

19 Furthermore, households excluded in all dimensions were more likely to be non-enrolled

20 or partially-enrolled (i.e. not all children enrolled within the household) than fully-

21 enrolled. These results suggest that equity in access for socially excluded children has not

22 yet been achieved. Efforts should be taken to improve coverage by removing the

23   remaining small, annually renewable registration fee, implementing and publicising the

24   new clause that de-links premium waivers from parental membership, establishing

25   additional scheme administrative offices in remote areas, holding regular registration

26   sessions in schools and conducting outreach sessions and providing registration support

27   to female guardians of children. Ensuring equitable access to NHIS will contribute

28   substantially to improving child health and reducing child mortality in Ghana.

29   **Key words:** Universal health coverage; National Health Insurance Scheme; social

30   exclusion; Ghana; children; enrolment

31

Introduction

Reaching universal health coverage (UHC) has become a primary goal of health systems globally to ensure that all people have access to quality health services in times of need and are protected from the financial hardships of health care costs (WHO, 2005, WHO, 2013). Many low-and middle-income countries (LMIC) have made significant efforts to reach this goal in recent decades through implementation of a variety of ambitious pre-payment Social Health Protection (SHP) schemes that aim to reduce reliance on regressive out-of-pocket payments. Ghana has emerged as a pioneer of these health financing reforms in Sub-Saharan Africa, becoming the first country in the region to implement a National Health Insurance Scheme (NHIS) (Rajkotia and Frick, 2012). Passed into law in 2003 through the National Health Insurance Act (Act 650), the NHIS aims to promote equitable access to health care for all by abolishing the previous 'cash and carry' user fee system that posed significant financial barriers to access for poor and vulnerable groups (Mensah et al., 2010, Witter and Garshong, 2009). To help expand coverage, premium payments are kept low, with the scheme largely financed through government funds and value added taxes (VAT) (NHIA, 2012). In addition, a number of premium exemptions are offered to specific groups, including children under-18 years of age. However, despite significant efforts to achieve universal population coverage, membership remains low with just 38% of the population being active members (i.e. in possession of an up-to-date NHIS card) in 2013 (NHIA, 2013). Furthermore, coverage remains unequitable, with the poor, women and rural inhabitants consistently shown to be

54   disproportionately uninsured (Akazili et al., 2014, Atinga et al., 2015, Jehu-Appiah et al.,

55   2011, Kusi et al., 2015a).

56   Previous studies have identified a number of causes of low overall enrolment in

57   NHIS, including unaffordability of premiums, perceived poor quality of health care,

58   perceptions of an inadequate benefit package due to some drugs and treatment for certain

59   conditions not being covered, lack of trust in NHIS officials and a complicated enrolment

60   process (Akazili et al., 2014, Atinga et al., 2015, Dixon et al., 2013, Jehu-Appiah et al.,

61   2011, Kusi et al., 2015a, Sarpong et al., 2010). What remains less clear is why enrolment

62   in NHIS continues to be unequitable, despite considerable efforts to enrol poor and

63   vulnerable groups through targeted removal of financial barriers. In order to fully

64   understand these inequities it is thus important to look beyond purely economic

65   explanations to also consider how factors in the wider social, cultural and political

66   environment may shape access to NHIS.

67   An important concept through which these wider determinants of access to SHP

68   can be analysed is that of social exclusion. A relatively new concept in the field of health

69   research, the social exclusion framework provides a holistic understanding of how

70   unequal social interactions and organizational/institutional barriers hinder the

71   effectiveness of equity-oriented interventions such as SHP (Mathieson et al., 2008). As

72   explained by the WHO's Social Exclusion Knowledge Network (SEKN), exclusion

73   consists of "dynamic, multidimensional processes driven by unequal power relationships

74   interacting across four main dimensions – social, political, economic and cultural"

75   (Popay et al., 2008). Social exclusion shapes deprivations, heightens inequalities, and

76   restricts social, political and economic participation for marginalized individuals or

77 groups (Babajanian et al., 2012, Popay et al., 2008). As further explained by SEKN,

78 "these exclusionary processes create a continuum of inclusion/exclusion characterised by

79 an unjust distribution of resources and unequal access to the capabilities and rights"

80 which are required to access SHP (Popay et al., 2008).

81 However, despite being an important concept through which to analyse SHP, few

82 studies have thus far assessed how social exclusion occurring in the broader environment

83 may affect access to health financing arrangements in LMIC (Williams et al., 2014). In

84 this study we respond to this evidence gap by investigating how the social, political,

85 economic and cultural dimensions of social exclusion influence access to NHIS and may

86 help explain persistently unequitable enrolment for excluded individuals. We focus

87 specifically on children aged under-18, a group that are eligible for a premium waiver.

88 We first analyse enrolment determinants for individual children and then investigate

89 exclusion of children *within* the household. Assessing intra-household exclusion is

90 important given that enrolment in NHIS is at the individual level; households may

91 therefore choose to enrol some children preferentially over others, for instance preferring

92 to enrol sons over daughters. We hypothesize that children vulnerable to exclusion in all

93 dimensions will be less likely to enrol in NHIS.

94 As far as we are aware, this is the first study of equity of enrolment in NHIS for

95 children using a social exclusion perspective. Using the social exclusion lens to assess

96 equity in health financing schemes will generate an improved understanding of the wider

97 determinants of health insurance enrolment for children and will help expand access

98 among this group. Reaching universal coverage of children is critical as it will contribute

99 significantly to reducing preventable infant and child mortality in Ghana. Furthermore,

4

100   timely access to health interventions in early life will have important implications for

101   improving future health and life outcomes (Blackwell et al., 2001, Marmot et al., 2008).

102

103   **The NHIS**

104   The NHIS has decentralised operations, with each district having its own insurance fund,

105   financed from central-level resources. The primary source of funding is a 2.5% VAT

106   levy, which contributes approximately 60% to total NHIS revenue (NHIA, 2012). Other

107   primary sources of funding include investment income (17%), premium contributions

108   from the Social Security and National Insurance Trust (SSNIT) pension scheme (16%)

109   and premiums and registration fees from the remaining population (<5%) (NHIA, 2012).

110   The scheme covers over 95% of disease conditions and includes inpatient, outpatient and

111   emergency care, deliveries, dental care and essential drugs. Enrolment in the NHIS is at

112   the individual level, with members required to register once to join the scheme and renew

113   their NHIS card annually to remain active members. Registration and renewal is

114   undertaken at a District Mutual Health Insurance Scheme (DHMIS) office or by a scheme

115   agent. Premium payments for formal sector workers are automatically deducted from

116   their SSNIT contributions, although renewal at a DHMIS is still required to become an

117   active member. Other individuals aged 18-69 pay a premium contribution and registration

118   fee which varies according to socioeconomic status and district (Kusi et al., 2015b,

119   NHIA, 2012). To enhance enrolment of vulnerable groups, indigents identified through

120   their community and pregnant women are exempt from paying premiums and registration

121   fees, although proof of exemption status such as an antenatal card must be shown at a

122   registration office. Older people aged over 70, SSNIT pensioners and children aged under

123   18 are exempt from paying premiums, but must pay an annual registration fee of

124   approximately Gh₵4.0 (US$2.7) (Kusi et al., 2015a). Until 2012, children aged under 18

125   were only entitled to a premium waiver if at least one parent or guardian was a member

126   of NHIS; this clause was abolished in 2010 for children under 5 and for all children in

127   2012, but is yet to be fully implemented (Kusi et al., 2015a). In 2013, an estimated 10.1

128   million people were NHIS members, corresponding to 38% of the Ghanaian population;

129   children accounted for 46.5% of active members (NHIA, 2013).

130

131   # Methodology

132

133   **Study design and data**

134   Data were collected from a cross-sectional household survey conducted in 2012 in five

135   regions: Central, Eastern, Ashanti, Brong-Ahafo and Northern, that covered the three

136   ecological zones of Ghana, coastal, forest and savannah. In each region, one district was

137   selected for sampling in consultation with the Ghana Statistical Service (GSS). These

138   districts are all relatively underdeveloped and were selected purposively to ensure a mix

139   of urban and rural areas and to ensure that a random sample of households would elicit a

140   significant sample of socially excluded individuals for our analysis. From each district,

141   27 nationally representative Enumeration Areas (EAs) were randomly selected by GSS.

142   EAs contain a mix of urban and rural areas and are determined by the GSS based on the

143   2000 Ghana population and Housing census to ensure nationally representative surveys.

144   Following MEASURE Demographic Health Surveys Program (ICF International, 2012)

145   guidance, 30 households were then randomly sampled for interviews from a household

146   list created in each EA, generating a total sample of 4050 households.

147   The household survey consisted of two separate questionnaires. Part I collected

148   data on basic demographics, the socio-economic situation of the household and its

149   members and information on health status, healthcare utilisation and NHIS membership;

150   this part of the questionnaire was administered to the household head or another adult

151   member responsible for household decisions. Part II included questions on social

152   exclusion and was administered to both the respondent to Part I and, where applicable,

153   his or her spouse. For our analysis, social exclusion variables were created from answers

154   provided by the respondent to Part I of the questionnaire for all households that contained

155   a child under-18. The questionnaire was designed in English, with interviews conducted

156   in local languages where appropriate.

157

158   **Social exclusion framework**

159   The analytical framework used to measure social exclusion follows the SEKN concept of

160   social exclusion as a multidimensional, dynamic process of exclusion across four

161   dimensions: social, political, economic and cultural (SPEC) (Popay et al., 2008). For each

162   dimension, we first undertook a comprehensive literature review to identify the domains

163   of resources and participation that influence social exclusion. Resources refer to means

164   such as wealth, assets or education that can be used to meet needs, while participation

165   describes the power and ability people have to utilise available resources (Popay et al.,

166   2008). For each domain, measurable indicators that can be considered as 'risk-factors' or

167   'drivers' of social exclusion in the Ghanaian context were then identified, firstly, by

7

168 reviewing relevant literature and then by identifying relevant questions asked in previous

169 household questionnaires such as the Demographic and Health Survey (DHS) and World

170 Values Survey. Following the approach utilized by Parmar et al., (2014) in their paper

171 investigating social exclusion of older people from SHP in Africa, we next combined

172 these indicators to create indices for social and cultural, economic and political exclusion

173 (Table 1). Given the close, interconnected relationship between social and cultural

174 indicators, these were combined into one dimension – sociocultural.

175

176 **Empirical strategy**

177 The determinants of child enrolment in the NHIS were estimated using a binary logistic

178 regression, following the basic model:

179 $$logit\ (p)= log\ (p/1\text{-}p)= \beta_0 + X_i.\beta_{i1} + SV_i.\beta_{i2}$$

180 The dependent variable, *Enrolled* is a binary variable indicating enrolment status as

181 no=0/yes =1, with *p* the probability that an individual is enrolled. *SVi* is a set of SPEC

182 variables (described in Table 2), *Xi* is a set of remaining core variables that may influence

183 enrolment, and *βs* are the model parameters. Children were considered enrolled if they

184 were registered, had renewed their NHIS membership and had a valid NHIS card for that

185 year.

186

187 *Determinants of enrolment at the individual level*

188 Two logistic regression models were estimated to study determinants of children's

189 enrolment status. We first estimated a regression model containing all *Xi* and *SVi*

8

190   variables (Model A), before next running a model containing *Xi* variables and *SPEC*

191   *indices* (Model B).

192

193   *Determinants of enrolment at the household level*

194   We next explored determinants of enrolment for households. We categorised households

195   into three categories: fully-enrolled (all children enrolled), partially-enrolled (some

196   children enrolled) and non-enrolled (no children enrolled). We ran a multinomial logit

197   regression (Model C) to compare how social exclusion was influencing the enrolment of

198   three categories of households. The dependent variable was the enrolment status of

199   household (1=fully-enrolled, 2=partially-enrolled and 3=non-enrolled). Variables

200   included in the model pertained to characteristics of the household and household head.

201

202   *Intra-household exclusion*

203   Last, we investigated individual-level intra-household exclusion. This analysis focussed

204   only on partially-enrolled households to explore the enrolment determinants for children

205   *within* the household. A binary logistic regression was estimated, with

206   *IntraHH_enrolment,* a binary outcome variable (1/0) indicating that a child is enrolled

207   when other children in the same household are not or that a child is not enrolled when

208   other children in the same household are enrolled (Model D). Variables included in the

209   model pertained only to individual characteristics of the child and not characteristics of

210   the household head or household.

211

212   As children may be from the same household, standard errors for binary regression

213   analyses were adjusted for clustering at the household level using the SPSS complex

214   sample procedure. All regression models were estimated using SPSS 21.

215

216   *Variables*

217   Variables included in our models are described in tables 2 and 3. Independent variables

218   for the regression analysis were divided into core variables and social exclusion variables

219   within the SPEC dimensions.

220

221   *Core variables*

222

223   Core variables included individual level variables for each child and variables measured

224   at the household level. At the individual level two binary variables, *majority_religion* and

225   *majority_ethnicity* were created as people belonging to a minority religion or ethnic

226   group may experience discrimination that prevents them from enrolling in SHP (Langer

227   and Ukiwo, 2008). The majority religion was defined as Christianity with the majority

228   ethnicity Akan, the largest ethnic group in Ghana. To account for adverse selection,

229   where unhealthier individuals that are more likely to use health care enrol more than

230   healthier individuals, a health status variable. measured by whether a child had been

231   hospitalised in the previous 12 months, was included. Relationship to household head

232   was created as a binary variable that captured if an individual was a child or grandchild of

233   the household head or another relation/not related. At the household level, variables for

234   age and gender of the household head and residence in an urban or rural area were

235 included as previous studies have frequently demonstrated their importance in

236 influencing enrolment in health insurance (Akazili et al., 2014, Parmar et al., 2014,

237 Sarpong et al., 2010). A variable capturing household size was also included as an

238 increasing number of members may reduce likelihood of enrolment. Lastly, a variable

239 capturing household head enrolment status was included as premium waivers for children

240 at the time of the survey were only available if at least one parent or guardian were

241 enrolled.

242

243 *Sociocultural variables*

244 Variables were included to capture existence of households' social networks and high

245 social position in the community, both key indicators of social inclusion and drivers of

246 increased participation in SHP (Mladovsky et al., 2014). The variable *association* was

247 created to capture whether a household head or their spouse was a member of an

248 association, including social or sports clubs, religious associations and women's groups.

249 To capture social position, a variable, *meeting_seat*, was created to show whether a

250 household head sat in the first two rows in community meetings, a traditional indicator of

251 high social standing and thus social inclusion in Ghana. In some LMIC, male children

252 have better access to resources than female children, a difference further exaggerated if

253 the male child is the only male child in the household (Garg and Morduch, 1998). A

254 variable *only_son*, was thus included as households with limited resources may choose to

255 enrol just one child, with preference given to sons over daughters. Lastly, a variable

256 capturing mother's education level was included as a measure of gender empowerment.

257 Ensuring gender empowerment and equality has been shown to be fundamental for

258   improving health of women and their families (PPD, 2013, Cleland and Van Ginneken,

259   1988) and may be important in determining health insurance enrolment. In Model D,

260   mother's education was replaced by household head education as children in some

261   extended households may not have the same mother.

262

263   *Political variables*

264   In the political dimension, power dynamics and discrimination generate micro-level

265   inequalities that restrict some individuals from accessing essential resources and

266   participating in public life. At the macro level, political exclusion results in rural, poor

267   communities, being less able to influence and capture benefits of political decisions on

268   allocation of physical resources such as health centres. Variables to measure political

269   exclusion were therefore primarily related to access to resources, in particular health

270   facilities (measured by walking distance to a NHIS accredited health facility), education

271   (measured by whether households had difficulties accessing education due to physical or

272   economic barriers) and information (measure by whether a household owned a TV or

273   radio). A variable to capture whether household heads had trust in the national

274   government was also included given that NHIS is a highly politicized, scheme, which

275   may reduce enrolment of individuals lacking trust in government institutions.

276

277   *Economic variables*

278   Principle components analysis (PCA) was used to calculate relative household wealth,

279   using variables including household ownership of durable goods (including a car, TV,

280   refrigerator, electric iron, bicycle etc), housing conditions (material of roof, source of fuel

281   for cooking, sanitation facilities) and number of livestock. After calculating PCA scores,

282   households were divided into quartiles, with Q1 representing the poorest households and

283   Q4 the richest. Following DHS methodological guidance (Rutstein, 2008), PCA scores

284   were calculated separately for urban and rural households due to the different

285   composition and importance of assets in these areas; consequently households in each

286   quartile for the sample may not exactly equal 25%. Additionally, a housing variable was

287   included to capture if a household owned their current house, as precariousness of shelter

288   is a key marker of material deprivation and social exclusion (Sen, 1992; Bhalla, 1997).

289   Furthermore, previous studies have shown the difficulties of enrolling informal sector

290   workers in LMIC in health insurance schemes (Ekman, 2004). A variable was therefore

291   included to capture if a household head worked in the formal or informal sector.

292

293   **Ethical approval**

294   Ethical approval for this research was obtained from Noguchi Memorial Institute for

295   Medical Research Institutional Review Board, Ghana [069/11-12].

296

297   # Results

298

299   *Descriptive statistics*

300   A total of 7686 children aged under-18 were recorded in 2819 households. The results

301   show that 54.4% of children and 46.6% of household heads were currently enrolled in

302   NHIS (Table 2). The average age of children was eight years and the majority of children

303   were children or grandchildren of the household head, resided in an urban area and lived

304   in a male-headed household. Only 4.7% of children had been hospitalised in the previous

305   12 months. The majority of households had good access to media, but lived far from a

306   health centre and did not have a household member that was a member of an association.

307   At the household level, a total of 446 households (15.8%) with children aged

308   under-18 were partially-enrolled, 1174 were non-enrolled (41.6%) and 1199 were fully-

309   enrolled (42.5%). A higher percentage of fully-enrolled than partially or non-enrolled

310   households were located in urban areas, belonged to the richest two quartiles, had a

311   female household head and had good access to media, health and education facilities

312   (Table 3). Average household size ranged from 4.67 members for fully-enrolled

313   households, to 5.00 for non-enrolled and 6.34 for partially-enrolled households.

314   Within partially-enrolled households, 1689 children (21.9% of the sample) had a

315   different enrolment status to other household members aged under-18. Of these

316   individuals, 50.9% were enrolled when other children in the household were not enrolled

317   (Table 2).

318

319   *Determinants of enrolment at the individual level*

320   Table 4 presents logistic regression estimates of enrolment determinants in NHIS for all

321   sampled children under-18. Results across all models indicate that geographic residence,

322   child health status and household head gender and insurance status significantly and

323   consistently influence child enrolment. A child residing in an urban area was

324   approximately 1.6 times more likely to be enrolled than their rural counterparts, with a

325   male-household head increasing odds of enrolment by 1.7 times. Evidence of adverse

326   selection was found, with children that were hospitalised two times more likely to be

327   enrolled than children that were not hospitalised. A child with an insured household head

328   was approximately 12 times more likely to be enrolled than a child with an uninsured

329   household head. An older household head and a larger household size also increased odds

330   of enrolment; however, odds ratios across all models were close to one.

331   Model A results show that a number SPEC variables significantly increased odds

332   of enrolment. A child of a mother with some education was 1.6 times more likely to be

333   enrolled than a child of a mother with no education. Similarly, children from households

334   reporting no difficulties accessing education were 1.4 times more likely to be enrolled

335   than counterparts in households experiencing difficulties in accessing education. A pro-

336   rich bias was found, with children from Q2, Q3 and Q4, 2.3, 1.9 and 1.5 times

337   respectively more likely to be enrolled compared to the poorest 25% of households.

338   Model B results indicate that children least vulnerable to economic and social

339   exclusion were 1.5 and 1.3 times respectively more likely to enrol in NHIS, than children

340   not at risk of exclusion in these dimensions. Political exclusion was not found to be

341   significant.

342

343   ***Determinants of enrolment at the household level***

344   Table 5 presents multinomial regression estimates of determinants of household

345   enrolment status. Across all models (C and D), rural households were approximately 1.6

346   times more likely to be non-enrolled and 1.4 times more likely to be partially-enrolled

347   than fully-enrolled in comparison to urban households. Larger households were also

348   significantly more likely to be partially or non-enrolled than fully-enrolled in comparison

349   to smaller households. Similarly, households with an older household head were more

350   likely to be fully-enrolled rather than partially or non-enrolled than households with a

351   younger household head, although odds ratios were close to one. Furthermore, the odds

352   of being fully-enrolled in comparison to non-enrolled increased for female-headed

353   households and households that had at least one member hospitalised in the previous

354   year, although household head gender and hospitalization did not significantly influence

355   enrolment status between partially and fully-enrolled households.

356   Model C results show that a number of SPEC variables influence household

357   enrolment status. In comparison to households with a head with some education,

358   households with an uneducated head were 1.8 times more likely to be non-enrolled and

359   1.4 times more likely to partially-enrolled than fully-enrolled. Furthermore, households

360   with no access to media and difficulties accessing education facilities were more likely to

361   be non-enrolled or partially-enrolled than fully enrolled in comparison to households with

362   access to media and educational facilities. Households with no trust in government were

363   found to be more likely to be fully-enrolled than partially-enrolled. Households in Q1 are

364   2.1 times more likely to be non-enrolled than fully-enrolled in comparison to the

365   wealthiest households; however, no significant differences were found between partially-

366   enrolled and fully-enrolled households in Q1 and Q4. Nonetheless, households from Q2

367   and Q3 were found to be approximately 2 times more likely to be non-enrolled or

368   partially-enrolled than fully-enrolled in comparison to households from Q4.

369 Lastly, results from model D indicate that households at risk of social, political and

370 economic exclusion were between 1.4 and 1.7 times more likely to be non-enrolled or

371 partially-enrolled than fully-enrolled in comparison to households not at risk of exclusion

372 in these dimensions.

373

374 ***Intra household exclusion***

375

376 Table 6 presents binary logistic regression estimates of intra-household enrolment status

377 – i.e. if a child had a differing enrolment status to other children in their household.

378 Results indicate that age, gender and being an only son had no significant influence on

379 intra-household enrolment. However, children that had been hospitalised in the 12

380 months prior to the survey and children who were a child or grandchild of the household

381 rather than another relative or non-relative were two times more likely to be enrolled

382 when other child household members were not enrolled.

383

384 # Discussion

385

386 This study analysed data from a household survey in Ghana to assess whether social

387 exclusion is restricting access to NHIS for children. Our findings indicate that 45.6% of

388 sampled children remain uninsured, despite the introduction of premium waivers for this

389 group. Furthermore, only 42.5% of households enrolled all household children; 15.8% of

390 households only insured some children, thus remaining partially-enrolled, while 41.6% of

17

391 households have not enrolled any child members. Inequalities in enrolment for children

392 persist and are caused by a range of disadvantages across the sociocultural, political and

393 economic dimensions of social exclusion. The inequalities generated across these

394 dimensions are discussed in the remainder of this section.

395

396 **Sociocultural exclusion**

397

398 Our results indicate a strong link between gender empowerment and child enrolment in

399 the NHIS. The finding that individual children from female (rather than male) headed

400 households were significantly less likely to be enrolled contrasts with results from many

401 studies which find female-headed households more likely invest in health and thus enrol

402 in health insurance schemes due to their traditional roles as care givers (Chankova et al.,

403 2008, Jehu-Appiah et al., 2011). However, results on household level enrolment indicate

404 that female-headed households are more likely to be fully-enrolled than non-enrolled (i.e.

405 have no children insured). These results are seemingly contradictory but suggest that

406 when female-household heads have the capacity to invest in health insurance, they are

407 likely to enrol all children. The fact that all children in some female-headed households

408 remain uninsured could indicate that exclusionary mechanisms are operating against

409 certain female-headed households in Ghana, restricting their ability to participate in

410 NHIS.

411   Odds of enrolment were also significantly lower for children with mothers with

412 no education. The positive relationship between education and health insurance

413 enrolment (Chankova et al., 2008, Jehu-Appiah et al., 2011, Parmar et al., 2014) and

414 between maternal education and child health has been long established in existing

415 literature (Cleland and van Ginneken, 1988, Marmot et al., 2008). Our findings thus

416 underline the importance of conducting outreach and awareness campaigns with

417 uneducated women to improve understanding of and enrolment in NHIS. They also

418 highlight the importance of addressing the wider social determinants of health to improve

419 health equity by improving educational attainment and gender empowerment of women

420 and girls (Marmot et al., 2008).

421   Encouragingly, other sociocultural variables including ethnicity, religion and

422 social networks did not significantly influence enrolment status at either the individual or

423 household level. Nevertheless, SPEC indices in all models indicate that children from

424 socioculturally excluded households were significantly less likely to be enrolled than

425 children from socially included households. This supports our hypothesis that

426 vulnerability to social exclusion is restricting access to NHIS.

427

428

429 **Political exclusion**

430

431   Our findings indicate that inequities in the politician dimension are important for

432 determining NHIS enrolment. First, household head enrolment was significantly

433 associated with child membership, an expected result given that, at the time of the survey,

434 child premium exemptions were only available if at least one parent or guardian was

435 enrolled. It is thus encouraging that a law was introduced in 2012 de-linking child

436 membership from parental enrolment as this will likely increase enrolment rates for

437 excluded children (Kusi et al., 2015a). However, it has not been fully operationalized

438 across Ghana, making it important that this is achieved quickly and efforts taken to make

439 excluded households aware of this change in entitlement.

440   Geographic inequities in access to NHIS for rural communities identified in this

441 study (models A-D) have previously been established in existing literature (Akazili et al.,

442 2014, GSS et al., 2009, Parmar et al., 2014, Sarpong et al., 2010). Yet, in contrast to

443 much existing evidence, our results intimate that distance to a health facility is not

444 significantly related to enrolment. This suggests inequities are due instead to

445 administrative barriers such as lack of access to scheme registration offices or poor

446 quality of health care in these areas that deters individuals from enrolling. Current spatial

447 inequities in distribution of these physical resources is likely driven by poor communities

448 remote from Accra having limited political influence, and consequently less ability to

449 shape and capture the benefits from political decisions on resource allocation.

450   Additional findings demonstrating the role of poor access to media (models A and

451 C) further emphasise that political exclusion significantly reduces access to NHIS. This is

452 likely due in part to more exposure to media campaigns on NHIS, improving awareness

453 and understanding of the benefits of the scheme and child exemptions (Parmar et al.,

454 2014, Schneider and Diop, 2004). Having trust in the national government decreased the

455 odds of a household fully insuring all child members. This is likely due to the NHIS

456 being associated with the New Patriotic Party (NPP) who introduced the scheme in 2003,

457 but were not in power at the time of our survey. Thus some people who trusted the

458 current government may be less likely to join if they associated NHIS it with the NPP.

459 This highlights the importance of ensuring NHIS is not seen as a partisan issue but as a

460   cross-party political concern. An analysis of the SPEC indices of social exclusion

461   emphasises that risk of exclusion in the political dimension significantly reduces

462   enrolment in NHIS at both the individual and household levels.

463   These results clearly indicate that households with greater access to material and

464   physical resources and information are more likely to enrol child household members.

465   Reducing inequities in the political dimension by addressing the unfair distribution of

466   resources in poor and rural communities is thus necessary to improve enrolment rates

467   (Marmot et al., 2008). Sustained investment in rural development and poor communities,

468   in particular targeting improvements in quality of care and establishment of more NHIA

469   offices, should be undertaken to ensure equity in resources and opportunities in all

470   regions in Ghana.

471

472   **Economic exclusion**

473

474   Our analysis found significant evidence of economic inequalities in enrolment (models

475   A-D). These findings are consistent with previous studies that have found strong

476   evidence of persistently low enrolment for the poor in NHIS (Jehu-Appiah et al., 2011,

477   Odeyemi and Nixon, 2013, Parmar et al., 2014, Sarpong et al., 2010).

478   The continuing pro-rich bias of NHIS comes despite considerable efforts to enrol

479   poor children through implementation of a premium waiver scheme. Although this

480   represents a laudable effort to promote enrolment, the requirement of paying a small,

481   annually renewable registration fee to enrol children is likely creating financial barriers

482   for the poorest households (Parmar et al., 2014, Wang et al., 2005). This is particularly

483   true for larger households, who were more likely to be partially-enrolled than smaller

484   households, and extended families that were more likely to enrol children or

485   grandchildren of the household head rather than other relatives or non-relatives. These

486   results likely indicate households' willingness to enrol in health insurance, but inability to

487   register all household members aged under-18. Removal of this registration fee is

488   therefore fundamentally important to increase enrolment for poor children and improve

489   equity within households (Kusi et al., 2015b, Parmar et al., 2014).

490   Despite strong evidence of a pro-rich bias, our study did not uncover inequalities

491   in enrolment for children with a household head employed in the informal sector. This

492   contrasts with results from other studies on health insurance in LMIC that report low

493   enrolment for informal sector workers, often due to lack of understanding of insurance

494   schemes and inability to afford premiums (Abel-Smith, 1992, Ekman, 2004, Mathauer et

495   al., 2008). This finding is ostensibly encouraging given that enrolment of informal sector

496   workers is often identified as a critical barrier to expanding population coverage of

497   insurance schemes and may reflect high awareness of NHIS among the Ghanaian

498   population. However, given low overall enrolment rates, it may also reflect that formal

499   sector workers are unwilling to join the scheme. Constraints to enrolling formal sector

500   workers are likely due to supply-side issues such as poor quality of health care and

501   perceived limited benefits package (Jehu-Appiah et al., 2011, Kusi et al., 2015b). To

502   expand enrolment of all children in the NHIS it is therefore important to address both

503   systemic scheme issues, while simultaneously reducing social and institutional barriers to

504   enrolment across the sociocultural, political and economic dimensions of exclusion.

505

Limitations

It should be noted that our study has some limitations. First, this paper conducted a quantitative investigation of the multiple indicators of social exclusion using a set of binary/dichotomous variables. Although this provided valuable insights into the influence of exclusion on access to SHP schemes, further mixed methods research is needed to fully understand the complex mechanisms behind social exclusion processes. Secondly, we did not analyse utilization of health care or health outcomes as this was beyond the scope of the study. However, even among enrolled children it is possible that benefits from the NHIS, in terms of health care access and reduced out-of-pocket payments, are disproportionately captured by socially included individuals. Further research is therefore needed to determine whether these benefits are distributed equally among enrolled children. Lastly, we did not explore supply-side constraints that may induce households to rationally choose not to enrol in the NHIS. Further research should be conducted to explore how supply-side constraints such as perceptions of the scheme and health care quality influence enrolment patterns of socially included and excluded groups.

Conclusion

Our study indicates that equity in access for socially excluded children has not yet been achieved within the NHIS. Despite children being exempt from paying premiums, the most economically vulnerable are still less likely to enrol. Efforts should be undertaken to enrol the poorest children by fully implementing the de-linking of premium waiver

528 entitlements from parental membership and removing the remaining registration fee.

529 However, solely targeting the removal of financial barriers will be insufficient to enhance

530 enrolment of children; it is also necessary to address wider disadvantages across the

531 sociocultural and political dimensions of social exclusion. Additional scheme

532 administrative offices should be established in rural and poor areas to register remote

533 communities, with regular registration sessions held in schools. Community outreach

534 workers should be utilised to provide information on the NHIS and support with the

535 registration process to female guardians of children. Simultaneous efforts to address

536 systemic issues associated with the scheme such as inconvenient enrolment processes and

537 improving quality of health care should also be undertaken. Investing in these reforms

538 will help reach universal coverage of children, thereby improving child health and

539 contributing substantially to reductions in child mortality in Ghana.

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643

644   **Tables and figures**

645

646   **Table 1:** SPEC Indices of social exclusion

SPEC indices for individual level analysis of determinants of enrolment		
Dimension	**Domain**	**Variables**
Sociocultural	Gender empowerment	Mother's education*
	Social participation of household	Household head/spouse not a member of any association/club
	Gender discrimination	Only son in household**
	Social status	Household head does not sit close to the front in community meetings (i.e. no decision making role)
Political	Access to information	Household has no access to a television or radio
	Trust in government	Household has no trust in national government
	Access to healthcare	Household has no health facility close by
	Access to education	Household has difficulty accessing education due to physical (distance) and economic (cost) barriers
Economic	Wealth inequality	Household belongs to the poorest two quartiles
	Precariousness of shelter	Not living in a family-owned household
	Economic participation	Household head does not have a professional

		occupation in the formal sector

*For analysis of household level enrolment, mother's education is replaced by household head education as

children from the same household may have different mothers

**Only son is not included as a SPEC variable for analysis of household level enrolment

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650 Table 2: Descriptive statistics for the entire sample of children <18 and children < 18 in –

651 partially-enrolled households

Variables	Definition	Percentage/mean for all children	Percentage/mean for children in partially-enrolled households
Enrolled	1=currently enrolled; 0=otherwise	54.4%	
Intra_enrolled	1=enrolled when other household members under 18 are not enrolled; 0=not enrolled when other household members under 18 are enrolled		50.9%
Core variables			
Age	scale	8.07	7.54
Male	1=male; 0=female	50.4%	49.9%
Majority_ethnicity	1=majority ethnicity; 0=otherwise	54.1%	
Majority_religion	1=majority religion; 0= otherwise	64.0%	

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Illness	1=hospitalised; 0=otherwise	4.6%	4.7%
Relationship_HHH	1= Child or grandchild of household head; 0= Other relative or non-relative	94.8%	92.4%
Age_HHH	scale	39	
Male_HHH	1=Male household head; 0=otherwise	73.6%	
Insured_HHH	1=Household head currently insured; 0=otherwise	46.6%	
Urban	1=Living in an urban area; 0=otherwise	51.6%	
Household_size	scale	6.32	
Sociocultural (SC) variables			
Association	1=A household member belongs to an association or club; 0=otherwise	45.5%	
Meeting_seat	1=Household is an official or sits in front two rows at community meeting; 0 = otherwise	24.1%	
Mother_education	1=Mother has some education; 0=otherwise	54.0%	
Only_son	1= Only son in family; 0=Female child or not only	13.4%	7.6%

	son in family	
Political (P) variables		
Access_media	1=Household has access to radio or television; 0=otherwise	79.6%
Trust_government	1= Household has trust in government; 0=otherwise	71.1%
Distance		47.4%
	1=Walking time to nearest health facility is 15 minutes or less; 0=otherwise	
Access_education	1=Household has no physical or economic difficulties in accessing education; 0=otherwise	58.6%
Economic (E) variables		
Housing	1=Family owns current house; 0=otherwise	88.1%
Professional	1=Household head has professional occupation in formal sector; 0=otherwise	33.3%
Wealth	Q1-Q4; Q1 = poorest 25% of	

	households; Q4 = richest 25% of households	
	Q1	26.4%
	Q2	24.9%
	Q3	25.4%
	Q4	23.3%

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653

654 **Table 3: Descriptive statistics for households with at least one child aged under 18**

Variables*	Fully-enrolled	Partially-enrolled	Non-enrolled
HH_Enrolled	42.5%	15.8%	41.6%
Core variables			
Majority_ethnicity	63.5%	54.7%	55.5%
Majority_religion	71.7%	62.6%	62.8%
Age_HHH	47.42	45.48	43.64
Male_HHH	62.9%	73.50%	72.9%
Urban	58.3%	49.3%	46.5%
Household_size	4.67	6.34	5.00
Hospitalized	3.4%	5.5%	8.2%
Sociocultural (SC) variables			
Association	48.0%	47.4%	43.3%
Meeting_seat	25.5%	21.1%	19.7%
Education_HHH	72.5%	63.4%	61.7%
Political (P) variables			
Access_media	83.9%	77.1%	73.9%
Trust_government	70.2%	75.9%	65.2%
Distance	53.7%	46.5%	42.4%
Access_education	68.7%	56.4%	55.6%

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Economic (E) variables				
Housing		86.0%	89.0%	85.3%
Professional		42.4%	35.10%	31.4%
Wealth				
	Q1	17.8%	24.0%	31.3%
	Q2	22.9%	29.0%	26.1%
	Q3	25.1%	25.3%	25.3%
	Q4	34.2%	21.7%	17.3%

655   **HH_enrolled = enrolment status of children in household (2=fully-enrolled; 1=partially-

656   enrolled; 0=non-enrolled); other variables are defined in Table 2

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Table 4: Binary logistic regression estimates of determinants of enrolment in NHIS for all children aged under 18

	Model A			Model B		
VARIABLES	**OR**	**SE**	**CI**	**OR**	**SE**	**CI**
Male	1.020	(0.076)	0.880-1.184	1.028	(0.064)	0.906-1.165
Age_child	1.003	(0.008)	0.989-1.018	1.005	(0.008)	0.991-1.020
Majority_religion	0.891	(0.172)	0.637-1.249	1.036	(0.163)	0.752-1.425
Majority_ethnicity	0.807	(0.153)	0.597-1.089	0.933	(0.149)	0.697-1.249
Urban	1.652	(0.113)***	1.322-2.063	1.561	(0.106)***	1.269-1.920
Hospitalized	1.964	(0.189)***	1.356-2.845	1.944	(0.189)***	1.341-2.816
Relationship_HHH	1.427	(0.206)	0.952-2.137	1.420	(0.206)	0.949-2.126
Male_HHH	1.679	(0.129)***	1.302-2.163	1.809	(0.123)***	1.423-2.301
Age_HHH	1.013	(0.0045*	1.004-1.022	1.015	(0.004)**	1.006-1.023

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Sociocultural	Insured_HHH	12.410	(0.112)***	9.961-15.462	12.819	(0.111)***	10.315-15.931
	Size_HH	1.065	(0.025)*	1.014-1.119	1.076	(0.025)**	1.025-1.130
	Mother_education	1.633	(0.139)***	1.234-2.145			
	Only_son	1.154	(0.120)	0.912-1.460			
	Meeting_seat	1.024	(0.134)	0.788-1.331			
	Association	1.062	(0.108)	0.859-1.313			
Political	Trust_government	0.962	(0.116)	0.766-1.207			
	Acces_media	0.796	(0.149)	0.594-1.068			
	Access_edu	1.408	(0.108)***	1.139-1.740			
	Distance	0.956	(0.109)	0.773-1.183			
Economic	Professional	0.867	(0.131)	0.670-1.121			
	Housing	1.203	(0.166)	0.868-1.668			
	Wealth: Q2	2.339	(0.185)*	1.627-3.362			
	Wealth: Q3	1.887	(0.173)***	1.343-2.651			
	Wealth: Q4	1.489	(0.159)***	1.089-2.034			
	SC_Index				1.356	(0.105)**	1.103-1.666
	P_Index				1.192	(0.109)*	0.962-1.476
	E_Index				1.505	(0.111)***	1.210-1.871
	Observations	6370			6370		

Dependent variable: Binary choice variable for enrolment

Acronyms: Odds Ratio (OR); Standard Errors (SE); Confidence Interval (CI); Socio-cultural (SC); Political (P); Economic (E);

Robust SE in parenthesis: *** p<.001, ** p<.01, * p<.05

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Table 5: Multinomial logistic regression estimates of household enrolment status

Model C	**Non-enrolled***	**Partially-enrolled***

	VARIABLES	OR	SE	CI	OR	SE	CI
	Majority_religion	1.105	(0.153)	0.818-1.493	0.807	(0.203)	0.542-1.202
	Majority_ethnicity	0.711	(0.143)	0.538-0.977	0.873	(0.184)	0.609-1.252
	Urban	1.650	(0.111)***	1.328-2.052	1.389	(0.143)*	1.050-1.838
	Male_HH	0.677	(0.127)**	0.524-0.874	0.886	(0.169)	0.637-1.234
	Age_HH	0.969	(0.004)***	0.961-0.977	0.964	(0.006)***	0.954-0.975
	Size_HH	1.098	(0.026)***	1.045-1.155	1.359	(0.030)***	1.282-1.411
	Hospitalized	2.706	(0.248)***	1.666-4.395	1.355	(0.278)	0.786-2.338
Sociocultural	Education_HH	1.818	(0.134)***	1.398-2.365	1.386	(0.172)**	0.989-1.943
	Meeting_seat	1.239	(0.124)	0.971-1.580	1.555	(0.164)*	1.127-2.145
	Association	0.994	(0.106)	0.807-1.223	0.943	(0.136)	0.722-1.232
	Trust_government	0.941	(0.111)	0.757-1.171	0.671	(0.149)**	0.501-0.898
Political	Access_media	1.430	(0.148)*	1.071-1.911	1.607	(0.188)*	1.109-2.314
	Access_edu	1.327	(0.109)**	1.072-1.642	1.362	(0.138)*	1.072-1.844
	Distance	1.175	(0.105)	0.957-1.444	1.020	(0.135)	0.783-1.328
	Professional	1.157	(0.120)	0.914-1.465	0.979	(0.154)	0.723-1.325
Economic	Housing	1.574	(0.154)	1.163-2.130	1.038	(0.212)	0.685-1.571
	Wealth: Q1	2.583	(0.178)***	1.821-3.665	1.516	(0.230)	0.966-2.378
	Wealth: Q2	2.120	(0.161)***	1.546-2.909	1.819	(0.202)**	1.225-2.703
	Wealth: Q3	2.086	(0.146)***	1.568-2.776	1.435	(0.189)*	0.991-2.076
	Observations	1764					

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Model D		**Non-enrolled**			**Partially-enrolled**		
	VARIABLES	OR	SE	CI	OR	SE	CI
Co	Majority_religion	1.307	(0.146)	0.982-1.738	0.890	(0.194)	0.608-1.303

Majority_ethnicity	0.853	(0.136)	0.653-1.113	0.960	(0.179)	0.676-1.363
Urban	1.621	(0.101)***	1.329-1.977	1.393	(0.131)*	1.076-1.802
Male_HH	0.863	(0.120)	0.682-1.091	1.119	(0.157)	0.823-1.522
Age_HH	0.973	(0.004)***	0.966-0.981	0.966	(0.005)***	0.956-0.976
Size_HH	1.103	(0.025)***	1.050-1.158	1.362	(0.029)***	1.286-1.442
Hospitalized	2.667	(0.245)***	1.649-4.313	1.369	(0.276)	0/798-2.350
SC Index	1.369	(0.104)**	1.117-1.679	1.361	(0.136)*	1.084-1.845
P Index	1.453	(0.104)***	1.186-1.781	1.561	(0.134)**	1.124-1.993
E Index	1.734	(0.107)***	1.407-2.137	1.417	(0.138)**	1.111-1.883
Observations	2028					

(SPEC indices — row group label for SC Index, P Index, E Index)

661   ***Comparison category: fully-enrolled**

Table 6: Binary logistic regression estimates of intra-household exclusion

VARIABLES	OR	SE	CI
Gender	1.049	(0.104)	0.855-1.287
Age	0.994	(0.010)	0.975-1.014
Hospitalised	2.951	(0.271)***	1.736-5.017
Only_son	1.041	(0.197)	0.708-1.534
Relationship_HHH	2.005	(0.198)***	1.359-2.956
Observations		1689	

Dependent variable: Binary choice variable for enrolled when other household members under 18 are not enrolled

Robust SE in parenthesis: *** p<.001, ** p<.01, * p<.05

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Acknowledgements

Research highlights

- Study analyses if social exclusion determines enrolment of children in Ghana's NHIS

- Removing financial barriers has not promoted equitable enrolment for children

- Inequitable access for socially, economically and politically excluded children

- Need to address social, economic and political factors to improve child enrolment