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Equitable access to health insurance for socially excluded children? The case of the National Health Insurance Scheme (NHIS) in Ghana

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Abstract

To help reduce child mortality and reach universal health coverage, Ghana extended free membership of the National Health Insurance Scheme (NHIS) to children (under-18s) in 2008. However, despite the introduction of premium waivers, a substantial proportion of children remain uninsured. Thus far, few studies have explored why enrolment of children in NHIS may remain low, despite the absence of significant financial barriers to membership. In this paper we therefore look beyond economic explanations of access to health insurance to explore additional wider determinants of enrolment in the NHIS. In particular, we investigate whether social exclusion, as measured through a sociocultural, political and economic lens, can explain poor enrolment rates of children. Data were collected from a cross-sectional survey of 4050 representative households conducted in Ghana in 2012. Household indices were created to measure sociocultural, political and economic exclusion, and logistic regressions were conducted to study determinants of enrolment at the individual and household levels. Our results indicate that socioculturally, economically and politically excluded children are less likely to enrol in the NHIS. Furthermore, households excluded in all dimensions were more likely to be non-enrolled or partially-enrolled (i.e. not all children enrolled within the household) than fully-enrolled. These results suggest that equity in access for socially excluded children has not yet been achieved. Efforts should be taken to improve coverage by removing the

remaining small, annually renewable registration fee, implementing and publicising the new clause that de-links premium waivers from parental membership, establishing additional scheme administrative offices in remote areas, holding regular registration sessions in schools and conducting outreach sessions and providing registration support to female guardians of children. Ensuring equitable access to NHIS will contribute substantially to improving child health and reducing child mortality in Ghana.

Key words: Universal health coverage; National Health Insurance Scheme; social exclusion; Ghana; children; enrolment

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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

disproportionately uninsured (Akazili et al., 2014, Atinga et al., 2015, Jehu-Appiah et al., 2011, Kusi et al., 2015a).

Previous studies have identified a number of causes of low overall enrolment in NHIS, including unaffordability of premiums, perceived poor quality of health care, perceptions of an inadequate benefit package due to some drugs and treatment for certain conditions not being covered, lack of trust in NHIS officials and a complicated enrolment process (Akazili et al., 2014, Atinga et al., 2015, Dixon et al., 2013, Jehu-Appiah et al., 2011, Kusi et al., 2015a, Sarpong et al., 2010). What remains less clear is why enrolment in NHIS continues to be unequitable, despite considerable efforts to enrol poor and vulnerable groups through targeted removal of financial barriers. In order to fully understand these inequities it is thus important to look beyond purely economic explanations to also consider how factors in the wider social, cultural and political environment may shape access to NHIS.

An important concept through which these wider determinants of access to SHP can be analysed is that of social exclusion. A relatively new concept in the field of health research, the social exclusion framework provides a holistic understanding of how unequal social interactions and organizational/institutional barriers hinder the effectiveness of equity-oriented interventions such as SHP (Mathieson et al., 2008). As explained by the WHO's Social Exclusion Knowledge Network (SEKN), exclusion consists of "dynamic, multidimensional processes driven by unequal power relationships interacting across four main dimensions – social, political, economic and cultural" (Popay et al., 2008). Social exclusion shapes deprivations, heightens inequalities, and restricts social, political and economic participation for marginalized individuals or

groups (Babajanian et al., 2012, Popay et al., 2008). As further explained by SEKN, "these exclusionary processes create a continuum of inclusion/exclusion characterised by an unjust distribution of resources and unequal access to the capabilities and rights" which are required to access SHP (Popay et al., 2008).

However, despite being an important concept through which to analyse SHP, few studies have thus far assessed how social exclusion occurring in the broader environment may affect access to health financing arrangements in LMIC (Williams et al., 2014). In this study we respond to this evidence gap by investigating how the social, political, economic and cultural dimensions of social exclusion influence access to NHIS and may help explain persistently unequitable enrolment for excluded individuals. We focus specifically on children aged under-18, a group that are eligible for a premium waiver. We first analyse enrolment determinants for individual children and then investigate exclusion of children *within* the household. Assessing intra-household exclusion is important given that enrolment in NHIS is at the individual level; households may therefore choose to enrol some children preferentially over others, for instance preferring to enrol sons over daughters. We hypothesize that children vulnerable to exclusion in all dimensions will be less likely to enrol in NHIS.

As far as we are aware, this is the first study of equity of enrolment in NHIS for children using a social exclusion perspective. Using the social exclusion lens to assess equity in health financing schemes will generate an improved understanding of the wider determinants of health insurance enrolment for children and will help expand access among this group. Reaching universal coverage of children is critical as it will contribute significantly to reducing preventable infant and child mortality in Ghana. Furthermore,

timely access to health interventions in early life will have important implications for improving future health and life outcomes (Blackwell et al., 2001, Marmot et al., 2008).

The NHIS

The NHIS has decentralised operations, with each district having its own insurance fund, financed from central-level resources. The primary source of funding is a 2.5% VAT levy, which contributes approximately 60% to total NHIS revenue (NHIA, 2012). Other primary sources of funding include investment income (17%), premium contributions from the Social Security and National Insurance Trust (SSNIT) pension scheme (16%) and premiums and registration fees from the remaining population (<5%) (NHIA, 2012). The scheme covers over 95% of disease conditions and includes inpatient, outpatient and emergency care, deliveries, dental care and essential drugs. Enrolment in the NHIS is at the individual level, with members required to register once to join the scheme and renew their NHIS card annually to remain active members. Registration and renewal is undertaken at a District Mutual Health Insurance Scheme (DHMIS) office or by a scheme agent. Premium payments for formal sector workers are automatically deducted from their SSNIT contributions, although renewal at a DHMIS is still required to become an active member. Other individuals aged 18-69 pay a premium contribution and registration fee which varies according to socioeconomic status and district (Kusi et al., 2015b, NHIA, 2012). To enhance enrolment of vulnerable groups, indigents identified through their community and pregnant women are exempt from paying premiums and registration fees, although proof of exemption status such as an antenatal card must be shown at a registration office. Older people aged over 70, SSNIT pensioners and children aged under

18 are exempt from paying premiums, but must pay an annual registration fee of approximately Gh₵4.0 (US$2.7) (Kusi et al., 2015a). Until 2012, children aged under 18 were only entitled to a premium waiver if at least one parent or guardian was a member of NHIS; this clause was abolished in 2010 for children under 5 and for all children in 2012, but is yet to be fully implemented (Kusi et al., 2015a). In 2013, an estimated 10.1 million people were NHIS members, corresponding to 38% of the Ghanaian population; children accounted for 46.5% of active members (NHIA, 2013).

Methodology

Study design and data

Data were collected from a cross-sectional household survey conducted in 2012 in five regions: Central, Eastern, Ashanti, Brong-Ahafo and Northern, that covered the three ecological zones of Ghana, coastal, forest and savannah. In each region, one district was selected for sampling in consultation with the Ghana Statistical Service (GSS). These districts are all relatively underdeveloped and were selected purposively to ensure a mix of urban and rural areas and to ensure that a random sample of households would elicit a significant sample of socially excluded individuals for our analysis. From each district, 27 nationally representative Enumeration Areas (EAs) were randomly selected by GSS. EAs contain a mix of urban and rural areas and are determined by the GSS based on the 2000 Ghana population and Housing census to ensure nationally representative surveys. Following MEASURE Demographic Health Surveys Program (ICF International, 2012)

guidance, 30 households were then randomly sampled for interviews from a household list created in each EA, generating a total sample of 4050 households.

The household survey consisted of two separate questionnaires. Part I collected data on basic demographics, the socio-economic situation of the household and its members and information on health status, healthcare utilisation and NHIS membership; this part of the questionnaire was administered to the household head or another adult member responsible for household decisions. Part II included questions on social exclusion and was administered to both the respondent to Part I and, where applicable, his or her spouse. For our analysis, social exclusion variables were created from answers provided by the respondent to Part I of the questionnaire for all households that contained a child under-18. The questionnaire was designed in English, with interviews conducted in local languages where appropriate.

Social exclusion framework

The analytical framework used to measure social exclusion follows the SEKN concept of social exclusion as a multidimensional, dynamic process of exclusion across four dimensions: social, political, economic and cultural (SPEC) (Popay et al., 2008). For each dimension, we first undertook a comprehensive literature review to identify the domains of resources and participation that influence social exclusion. Resources refer to means such as wealth, assets or education that can be used to meet needs, while participation describes the power and ability people have to utilise available resources (Popay et al., 2008). For each domain, measurable indicators that can be considered as 'risk-factors' or 'drivers' of social exclusion in the Ghanaian context were then identified, firstly, by

reviewing relevant literature and then by identifying relevant questions asked in previous household questionnaires such as the Demographic and Health Survey (DHS) and World Values Survey. Following the approach utilized by Parmar et al., (2014) in their paper investigating social exclusion of older people from SHP in Africa, we next combined these indicators to create indices for social and cultural, economic and political exclusion (Table 1). Given the close, interconnected relationship between social and cultural indicators, these were combined into one dimension – sociocultural.

Empirical strategy

The determinants of child enrolment in the NHIS were estimated using a binary logistic regression, following the basic model:

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

The dependent variable, *Enrolled* is a binary variable indicating enrolment status as no=0/yes =1, with *p* the probability that an individual is enrolled. *SVi* is a set of SPEC variables (described in Table 2), *Xi* is a set of remaining core variables that may influence enrolment, and *βs* are the model parameters. Children were considered enrolled if they were registered, had renewed their NHIS membership and had a valid NHIS card for that year.

Determinants of enrolment at the individual level

Two logistic regression models were estimated to study determinants of children's enrolment status. We first estimated a regression model containing all *Xi* and *SVi*

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

Determinants of enrolment at the household level

We next explored determinants of enrolment for households. We categorised households into three categories: fully-enrolled (all children enrolled), partially-enrolled (some children enrolled) and non-enrolled (no children enrolled). We ran a multinomial logit regression (Model C) to compare how social exclusion was influencing the enrolment of three categories of households. The dependent variable was the enrolment status of household (1=fully-enrolled, 2=partially-enrolled and 3=non-enrolled). Variables included in the model pertained to characteristics of the household and household head.

Intra-household exclusion

Last, we investigated individual-level intra-household exclusion. This analysis focussed only on partially-enrolled households to explore the enrolment determinants for children *within* the household. A binary logistic regression was estimated, with *IntraHH_enrolment*, a binary outcome variable (1/0) indicating that a child is enrolled when other children in the same household are not or that a child is not enrolled when other children in the same household are enrolled (Model D). Variables included in the model pertained only to individual characteristics of the child and not characteristics of the household head or household.

As children may be from the same household, standard errors for binary regression analyses were adjusted for clustering at the household level using the SPSS complex sample procedure. All regression models were estimated using SPSS 21.

Variables

Variables included in our models are described in tables 2 and 3. Independent variables for the regression analysis were divided into core variables and social exclusion variables within the SPEC dimensions.

Core variables

Core variables included individual level variables for each child and variables measured at the household level. At the individual level two binary variables, *majority_religion* and *majority_ethnicity* were created as people belonging to a minority religion or ethnic group may experience discrimination that prevents them from enrolling in SHP (Langer and Ukiwo, 2008). The majority religion was defined as Christianity with the majority ethnicity Akan, the largest ethnic group in Ghana. To account for adverse selection, where unhealthier individuals that are more likely to use health care enrol more than healthier individuals, a health status variable. measured by whether a child had been hospitalised in the previous 12 months, was included. Relationship to household head was created as a binary variable that captured if an individual was a child or grandchild of the household head or another relation/not related. At the household level, variables for 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

improving health of women and their families (PPD, 2013, Cleland and Van Ginneken, 1988) and may be important in determining health insurance enrolment. In Model D, mother's education was replaced by household head education as children in some extended households may not have the same mother.

Political variables

In the political dimension, power dynamics and discrimination generate micro-level inequalities that restrict some individuals from accessing essential resources and participating in public life. At the macro level, political exclusion results in rural, poor communities, being less able to influence and capture benefits of political decisions on allocation of physical resources such as health centres. Variables to measure political exclusion were therefore primarily related to access to resources, in particular health facilities (measured by walking distance to a NHIS accredited health facility), education (measured by whether households had difficulties accessing education due to physical or economic barriers) and information (measure by whether a household owned a TV or radio). A variable to capture whether household heads had trust in the national government was also included given that NHIS is a highly politicized, scheme, which may reduce enrolment of individuals lacking trust in government institutions.

Economic variables

Principle components analysis (PCA) was used to calculate relative household wealth, using variables including household ownership of durable goods (including a car, TV,

refrigerator, electric iron, bicycle etc), housing conditions (material of roof, source of fuel for cooking, sanitation facilities) and number of livestock. After calculating PCA scores, households were divided into quartiles, with Q1 representing the poorest households and Q4 the richest. Following DHS methodological guidance (Rutstein, 2008), PCA scores were calculated separately for urban and rural households due to the different composition and importance of assets in these areas; consequently households in each quartile for the sample may not exactly equal 25%. Additionally, a housing variable was included to capture if a household owned their current house, as precariousness of shelter is a key marker of material deprivation and social exclusion (Sen, 1992; Bhalla, 1997). Furthermore, previous studies have shown the difficulties of enrolling informal sector workers in LMIC in health insurance schemes (Ekman, 2004). A variable was therefore included to capture if a household head worked in the formal or informal sector.

Ethical approval

Ethical approval for this research was obtained from Noguchi Memorial Institute for Medical Research Institutional Review Board, Ghana [069/11-12].

Results

Descriptive statistics

A total of 7686 children aged under-18 were recorded in 2819 households. The results show that 54.4% of children and 46.6% of household heads were currently enrolled in NHIS (Table 2). The average age of children was eight years and the majority of children were children or grandchildren of the household head, resided in an urban area and lived in a male-headed household. Only 4.7% of children had been hospitalised in the previous 12 months. The majority of households had good access to media, but lived far from a health centre and did not have a household member that was a member of an association.

At the household level, a total of 446 households (15.8%) with children aged under-18 were partially-enrolled, 1174 were non-enrolled (41.6%) and 1199 were fully-enrolled (42.5%). A higher percentage of fully-enrolled than partially or non-enrolled households were located in urban areas, belonged to the richest two quartiles, had a female household head and had good access to media, health and education facilities (Table 3). Average household size ranged from 4.67 members for fully-enrolled households, to 5.00 for non-enrolled and 6.34 for partially-enrolled households.

Within partially-enrolled households, 1689 children (21.9% of the sample) had a different enrolment status to other household members aged under-18. Of these individuals, 50.9% were enrolled when other children in the household were not enrolled (Table 2).

Determinants of enrolment at the individual level

Table 4 presents logistic regression estimates of enrolment determinants in NHIS for all sampled children under-18. Results across all models indicate that geographic residence, child health status and household head gender and insurance status significantly and

consistently influence child enrolment. A child residing in an urban area was approximately 1.6 times more likely to be enrolled than their rural counterparts, with a male-household head increasing odds of enrolment by 1.7 times. Evidence of adverse selection was found, with children that were hospitalised two times more likely to be enrolled than children that were not hospitalised. A child with an insured household head was approximately 12 times more likely to be enrolled than a child with an uninsured household head. An older household head and a larger household size also increased odds of enrolment; however, odds ratios across all models were close to one.

Model A results show that a number SPEC variables significantly increased odds of enrolment. A child of a mother with some education was 1.6 times more likely to be enrolled than a child of a mother with no education. Similarly, children from households reporting no difficulties accessing education were 1.4 times more likely to be enrolled than counterparts in households experiencing difficulties in accessing education. A pro-rich bias was found, with children from Q2, Q3 and Q4, 2.3, 1.9 and 1.5 times respectively more likely to be enrolled compared to the poorest 25% of households.

Model B results indicate that children least vulnerable to economic and social exclusion were 1.5 and 1.3 times respectively more likely to enrol in NHIS, than children not at risk of exclusion in these dimensions. Political exclusion was not found to be significant.

Determinants of enrolment at the household level

Table 5 presents multinomial regression estimates of determinants of household 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.

Lastly, results from model D indicate that households at risk of social, political and economic exclusion were between 1.4 and 1.7 times more likely to be non-enrolled or partially-enrolled than fully-enrolled in comparison to households not at risk of exclusion in these dimensions.

Intra household exclusion

Table 6 presents binary logistic regression estimates of intra-household enrolment status – i.e. if a child had a differing enrolment status to other children in their household. Results indicate that age, gender and being an only son had no significant influence on intra-household enrolment. However, children that had been hospitalised in the 12 months prior to the survey and children who were a child or grandchild of the household rather than another relative or non-relative were two times more likely to be enrolled when other child household members were not enrolled.

Discussion

This study analysed data from a household survey in Ghana to assess whether social exclusion is restricting access to NHIS for children. Our findings indicate that 45.6% of sampled children remain uninsured, despite the introduction of premium waivers for this group. Furthermore, only 42.5% of households enrolled all household children; 15.8% of households only insured some children, thus remaining partially-enrolled, while 41.6% of

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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

between maternal education and child health has been long established in existing literature (Cleland and van Ginneken, 1988, Marmot et al., 2008). Our findings thus underline the importance of conducting outreach and awareness campaigns with uneducated women to improve understanding of and enrolment in NHIS. They also highlight the importance of addressing the wider social determinants of health to improve health equity by improving educational attainment and gender empowerment of women and girls (Marmot et al., 2008).

Encouragingly, other sociocultural variables including ethnicity, religion and social networks did not significantly influence enrolment status at either the individual or household level. Nevertheless, SPEC indices in all models indicate that children from socioculturally excluded households were significantly less likely to be enrolled than children from socially included households. This supports our hypothesis that vulnerability to social exclusion is restricting access to NHIS.

Political exclusion

Our findings indicate that inequities in the politician dimension are important for determining NHIS enrolment. First, household head enrolment was significantly associated with child membership, an expected result given that, at the time of the survey, child premium exemptions were only available if at least one parent or guardian was enrolled. It is thus encouraging that a law was introduced in 2012 de-linking child membership from parental enrolment as this will likely increase enrolment rates for

excluded children (Kusi et al., 2015a). However, it has not been fully operationalized across Ghana, making it important that this is achieved quickly and efforts taken to make excluded households aware of this change in entitlement.

Geographic inequities in access to NHIS for rural communities identified in this study (models A-D) have previously been established in existing literature (Akazili et al., 2014, GSS et al., 2009, Parmar et al., 2014, Sarpong et al., 2010). Yet, in contrast to much existing evidence, our results intimate that distance to a health facility is not significantly related to enrolment. This suggests inequities are due instead to administrative barriers such as lack of access to scheme registration offices or poor quality of health care in these areas that deters individuals from enrolling. Current spatial inequities in distribution of these physical resources is likely driven by poor communities remote from Accra having limited political influence, and consequently less ability to shape and capture the benefits from political decisions on resource allocation.

Additional findings demonstrating the role of poor access to media (models A and C) further emphasise that political exclusion significantly reduces access to NHIS. This is likely due in part to more exposure to media campaigns on NHIS, improving awareness and understanding of the benefits of the scheme and child exemptions (Parmar et al., 2014, Schneider and Diop, 2004). Having trust in the national government decreased the odds of a household fully insuring all child members. This is likely due to the NHIS being associated with the New Patriotic Party (NPP) who introduced the scheme in 2003, but were not in power at the time of our survey. Thus some people who trusted the current government may be less likely to join if they associated NHIS it with the NPP. 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

entitlements from parental membership and removing the remaining registration fee. However, solely targeting the removal of financial barriers will be insufficient to enhance enrolment of children; it is also necessary to address wider disadvantages across the sociocultural and political dimensions of social exclusion. Additional scheme administrative offices should be established in rural and poor areas to register remote communities, with regular registration sessions held in schools. Community outreach workers should be utilised to provide information on the NHIS and support with the registration process to female guardians of children. Simultaneous efforts to address systemic issues associated with the scheme such as inconvenient enrolment processes and improving quality of health care should also be undertaken. Investing in these reforms will help reach universal coverage of children, thereby improving child health and contributing substantially to reductions in child mortality in Ghana.

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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%	

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	1=Walking time to nearest health facility is 15 minutes or less; 0=otherwise	47.4%
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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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%

*****HH_enrolled = enrolment status of children in household (2=fully-enrolled; 1=partially-enrolled; 0=non-enrolled); other variables are defined in Table 2

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

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***

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	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
	Housing	1.574	(0.154)	1.163-2.130	1.038	(0.212)	0.685-1.571
Economic	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
SPEC indices	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					

***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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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

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