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Sex differences and factors associated with disability among Ghana's workforce: a nationally stratified cross-sectional study

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ABSTRACT

Objective This study was conducted to estimate the prevalence of disability and associated factors and further quantify the associated sex differential among Ghana's workforce aged 15+ years.

Design A nationally stratified cross-sectional study.

Setting Ghana.

Participants Individuals aged 15 years and above.

Outcome measure Disability that limits full participation in life activities.

Methods Three predictive models involving Poisson, logistic and probit regression were performed to assess the association between disability and covariates. Modified Poisson multivariate decomposition analysis method was employed to assess sex differential and associated factors using Stata V.16.

Results The prevalence of disability was 2.1% (95% CI 1.2 to 2.4), and the risk of disability among males was approximately twice compared with females (Poisson estimate: adjusted prevalence ratio (95% CI)=1.94 (1.46 to 2.57); logistic estimate: aOR (95% CI)=2.32 (1.73 to 3.12)). Male sex increased the log odds of disability by 0.37 (probit estimate, aβ (95% CI)=0.37 (0.23 to 0.50)). The variability in age group, marital status, household (HH) size, region, place of residence, relationship to HH head, hours of work per week and asset-based wealth were significantly associated with disability-based sex differential. (Significant increased endowment: $\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=−37.48 (−56.81 to −18.16) and significant decreased coefficient: $\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=42.31 (21.11 to 63.49).) All disability participants were challenged with activities of daily living, limiting them in full participation in life activities such as mobility, work and social life.

Conclusion The magnitude of experiencing disability among working males was nearly twice that of females. Sex differentials were significantly associated with age groups, marital status, HH size, region of residence, relationship to HH head, hours of work per week and wealth. Our findings amass the provisional needs of persons living with a disability that are indicators to consider to achieve the United Nations Convention on the Rights of Persons with Disabilities Article 10. In addition, formulation of workplace policies should adopt a gender-sensitive approach to reduce disparities and eliminate disability in the target population.

Strengths and limitations of this study

- The study employed a nationally representative, probability-based cross-sectional sample survey among Ghana's labour force aged 15 years and above.
- The prevalence of disability, associated factors and sex differences were estimated by adopting a robust analytical method.
- The various forms of disability were: physical, sight, hearing, speech, intellectual and emotional, whereas the causes of disability include: disease/illness, natural ageing, congenital, other accident, transport and occupational injury. All the aforementioned variables were subjectively reported.
- The design of our study does not allow us to establish causation.

INTRODUCTION

Disability is a broad term for impairments, activity limitations and participation restrictions of the ability to perform an activity.[1] Without intervention, it can result in a handicap, a state of disadvantage for a given individual that limits or prevents the fulfilment of a role that is normal.[1] Several forms of disability exist, common among them are physical (mostly caused by motor vehicle or car), visual, hearing and cognitive disability. It could also result from a congenital, developmental or acquired impairment such as occupational injury.[2 3]

Globally, the prevalence of disability approximates 15%,[4] while in Ghana, it is estimated at 11.3% among persons who are not in the labour force.[5] Opoku *et al*[2] established

that the major effect of disability is evident in the working population. About one in eight workers report either long-term disability or basic activity limitation in most developed countries, with the proportion rising to as high as one in five in France and other provinces.[3 6] Many countries have been collecting prevalence data on disability through censuses and surveys, with many having moved from an impairment approach to difficulties in functioning approach.[7] This accounts for wide variations in estimates of rates of disability across and within nations. The rates of disability are increasing due to early exposure to dangerous or hazardous work.[8]

Disability is extremely diverse, with some health conditions resulting in poor health and extensive healthcare needs that require mainstream healthcare services.[1] Sex differences exist among most forms of disabilities, with females generally having a higher prevalence of disability. Generally, though women tend to live longer compared with males,[9] in contrast, they are more likely to experience moderate and severe disability conditions compared with males.[10]

Other studies argued that the magnitude of sex differences in disability varies depending on the specific nature of gender roles.[11 12] For instance, in settings where gender roles are similar, differences in disability may also be smaller.[11] While the existence of gender differences has been established by extant literature, the factors associated with these differences are less well studied. Two key objectives for Ghana Labour Force Survey (LFS), which motivated this analysis, were: (1) to provide up-to-date information for assessing the labour force situation in the country and (2) to provide empirical evidence needed for monitoring the progress of current labour force indicators. This analysis was conducted to assess the factors associated with disability in Ghana's workforce and further quantify sex differential of disability to inform workplace policy and safety measures addressing disability.

METHODS

This analysis was based on data from the maiden Ghana LFS conducted by the Ghana Statistical Service in the year 2015. It was a standard household (HH)-based survey of work-related activities and injuries among Ghanaians involving detailed information on all aspects of employment and unemployment. The survey was to inform implementation, monitoring and evaluation of various labour and employment policies and programmes in Ghana.[5]

Sample design

The 2015 LFS was a nationally representative, probability-based sample survey designed to cater for a variety of analyses in the domains of interest relating to the labour situation based on a two-stage stratified random sampling design. The first stage involved the selection of 402 enumeration areas (EAs), stratified by region, as well as by urban and rural location. Based on the grouping into rural–urban within each of the then 10 administrative regions, 20 strata were involved in the study[5]. The HHs in the selected EAs constituted the secondary sampling units for the second stage of the sample selection. The second stage involved 15 HHs selected from each of the 402 EAs (6030 HHs) with an equal chance of being selected.

Study participants

A total of 10 932 individual workers were selected across the country, inclusive of the population in the labour force (adult Ghanaians aged 15+ years), with a response rate of 87.9% (representing 9604 workers). The labour workforce was based on the International Labor Organization definition, which is 'a person aged 15+ years and economically active by engaging in any form of work'.[12 13] Two questionnaires were used in the LFS: HH and individual questionnaires. The HH questionnaire was used to collect information on the age, sex and education of each member of the HH and the relationship to the HH to identify eligible persons 15+ years for the individual interview[5]. Details on the LFS procedure and methods adopted is described elsewhere.[5]

Outcome measure

The main outcome variable of interest was self-reported disability irrespective of type, namely, physical, sight, hearing, speech, intellectual, emotional or any other form of disability. In assessing disability status among individual participants, LFS asked the question: '*Does (NAME) have any disability that limits his/her full participation in life activities (such as mobility, work, social life, etc)?*' with a recoded response of yes=1 or no=0. If a participant responded 'Yes', a further question was asked to determine the type of disability. Disability, our outcome variable was self-reported.

Covariate

This analysis assessed 18 covariates involving individual and HH characteristics and included: age group in years (≤19, 20–29, 30–39 and 40+), sex difference (male or female), marital status (married, separated/divorced, widowed or never married), educational level (none, primary, Junior High School (JHS), Senior High Schhol (SHS) and tertiary), currently working (no or yes), weeks engaged in work/12 months (none, 1–9 and 20+), religion (Christianity, Islam or other), HH size (1 person, 2–4 persons or 5+ persons), region (the then 10 administrative regions in Ghana), place of residence (urban vs rural) and relationship to HH head (HH head, spouse, child or other).

Other covariates were: place of birth (this village or different village), engaged in a non-farm activity (yes or no), did any work for pay (yes or no), hours work/week (none, 1–29 or 30+), visited any place outside HH (yes or no), HH rooms for a living (1 room, 2 rooms or 3+ rooms) and asset based wealth (low, medium or high). Detailed variable definition, type of variable, measurement and

scale of measurement used in this study have been clearly defined in online supplemental table 1.

Data analysis

Due to the two-stage sampling technique adopted by LFS including its sampling weights, this analysis adjusted for the clustering (the primary sampling units (PSUs)), stratification and the sampling weights used in the survey to reduce bias and to improve the precision of all our estimates. This process was deemed appropriate since the data used were weighted at the data management stage, taking into consideration the probability of selecting a PSU from a region and an HH from the PSU. The final weight was then standardised because the sampling design adopted was not self-weighting since HHs were perpetually selected with unequal probabilities in the second stage of sampling. To account for the variability, adjustment for the design effect to account for differences in selection probability was deemed appropriate in this analysis. Before inferential analysis was adopted, multicollinearity analysis was performed to identify any potential high correlation between our outcome variable and the independent variables. This was performed by adopting the variance inflation factor (VIF). After the initial analysis, there was no high value of VIF between our variables (VIF <10).

We adopted three analytical procedures and approaches for the data analysis:

1. The Rao-Scott χ^2 test of association for a complex survey between the outcome variable and the corresponding covariate variables was performed as bivariate analysis. This method was performed to assess significant differences in the prevalence rate of disability among covariates. Due to the design of LFS (various sampling techniques in a complex design), the sample design effect was considered in our bivariate analysis by adopting the Rao-Scott χ^2 test of independence. This method showed the effect of design on the tests of fitness, homogeneity and independence.[14]
2. Factors influencing disability were determined by adopting Poisson, Logistic and Probit regression models individually. These models were adopted to establish the factors influencing disability by using the log-likelihood ratio and the log odds of experiencing disability in the Ghanaian labour force.[15] As established by Chen *et al*[16], occasionally, OR, as estimated from logistic regression, approximates the prevalence ratio from Poisson estimates. Thereby, when events have a common outcome, the OR mostly overestimate the prevalence ratios. Employing these models independently provides a holistic understanding of the factors associated with disability by looking at the log-likelihood ratio (Poisson), log odds (logistic) and normalised coefficients (probit). In addition, Tetteh *et al*[17] adopted similar procedures in establishing factors associated with visual impairment among older adults in Ghana.
3. A weighted, modified Poisson multivariate decomposition analysis method was adopted[18] to assess sex differences in the prevalence of disability: in this present analysis, we assessed how disability is influenced by individual characteristics (males vs females). The purpose of the decomposition analysis was to identify characteristics that influence disability between the sexes. The analytical procedures adopted demonstrated associated factors attributable to the characteristics (ie, the differences in disability proportions endowments) and associated factors attributable to the effect of the characteristic (ie, differences in the coefficients) if females and males were treated equally in the workforce in Ghana. It provides detailed decomposition and standard errors for both the component and coefficient of the characteristic, compared with Blinder-Oaxaca.[18] Previous use of this method exist and has been applied in health research in Ghana[19] and elsewhere.[20–22]

Stata V.16.1 was used to perform all analysis, and p value ≤0.05 was deemed significant.

Public involvement statement

The Ghana Statistical Service organises national stakeholders meeting to disseminate the findings of the national living standard survey. A report of the national survey based on all data collected is provided to the general public and available on the Ghana Statistical Service website.

RESULTS

This study involved a total of 10 932 adult Ghanaians in the labour force aged 15+ years. The overall mean (±SD) age among participants was 37.36 (±16.60) years; however, the mean age of participants with disability (PWD) (60.99 (±21.76) years) was statistically different from that of participants without disability (36.56 (±15.81) years) (F-test=396.8, p value <0.0001). The prevalence of disability was 2.1% (95% CI 1.2% to 2.4%) and Rao-Scott test of independence showed a significant association between disability and all covariates (p value ≤0.05) except for a place of residence (p value >0.05) (table 1). The various forms of disability ranked from highest to lowest prevalence were: physical, sight, hearing, speech, intellectual, emotional and other forms (figure 1). The most frequent causes of disability were disease/illness, natural ageing, congenital, other accident, transport and occupational injury (figure 1).

Poisson, logistic and probit estimates of factors associated with disability in Ghana's workforce, GSS 2015

Sensitivity analysis involving Poisson, logistic and probit regression models, adjusting for all covariates estimates showed that sex, age group, marital status, weeks engaged in work/12 months, HH size, region, place of residence, relationship to HH, hours of work within 7 days and asset-based wealth significantly influenced disability (table 2).

Table 1 Prevalence of disability and associated factors in Ghana's workforce[5]

Characteristics	Disability status		Rao-Scott χ^2
	No	Yes	
	Prevalence (95% CI)	Prevalence (95% CI)	
Prevalence (95% CI)	97.8 (97.6 to 98.1)	2.1 (1.2 to 2.4)	
	Weighted %	Weighted %	
Age (mean (±SD)=37.36 (16.60))	36.56 (15.81)	60.99 (21.76)	396.8§,‡
Age group (years)			83.82‡
≤19	99.1	0.9	
20–29	99.0	1.0	
30–39	98.9	1.1	
40+	93	7.0	
Sex			3.1*
Male	95.4	4.6	
Female	96.9	3.1	
Marital status			119.94‡
Married	97.7	2.3	
Separated/divorced	92.9	7.1	
Widowed	85.4	14.6	
Never married	98.3	1.7	
Educational level			10.35‡
None	95	5	
Primary	96.5	3.5	
JHS	98.5	1.5	
SHS	96.7	3.3	
Tertiary	97.9	2.1	
Currently working			3.85*
No	96.5	3.5	
Yes	97.5	2.5	
Weeks engaged in work/12 months			20.57‡
None	97.7	2.3	
1–9	95.9	4.1	
20+	94.9	5.1	
Religion			7.19‡
Christian	96.9	3.1	
Islam	97.1	2.9	
Other	94.5	5.5	
HH size			6.82‡
1 person	95.3	4.7	
2–4 persons	96.6	3.4	
5+ persons	97.4	2.6	
Region			6.39‡
Western	97.3	2.7	
Central	97.1	2.9	
GAR	98.8	1.2	
Volta	95.2	4.8	
Eastern	96.3	3.7	

Continued

Table 1 Continued

Characteristics	Disability status		Rao-Scott χ^2
	No	Yes	
	Prevalence (95% CI)	Prevalence (95% CI)	
Prevalence (95% CI)	**97.8 (97.6 to 98.1)**	**2.1 (1.2 to 2.4)**	
	Weighted %	Weighted %	
Ashanti	96.6	3.4	
Brong Ahafo	96.1	3.9	
Northern	96.4	3.6	
Upper East	91.4	8.6	
Upper West	96.5	3.5	
Place of residence			2.37
Urban	97	3.0	
Rural	96.4	3.6	
Relationship to HH			22.65‡
HH head	96.3	3.7	
Spouse	98.4	1.6	
Child	97.8	2.2	
Other	92.4	7.6	
Place of birth			8.24†
This village	96.2	3.8	
Different village	97.3	2.7	
Engaged in non-farm activity			25.88‡
Yes	98.2	1.8	
No	96.2	3.8	
Did any work for pay			37.10‡
Yes	99.1	0.9	
No	96.3	3.7	
Hours work/week			8.13†
None	94.7	5.3	
1–29	97.6	2.4	
30+	98.4	1.6	
Visited any place outside HH			16.54‡
Yes	97.8	2.2	
No	96.2	3.8	
HH rooms for living			3.66*
1 room	97.2	2.8	
2 rooms	96.6	3.4	
3+ rooms	96	4	
Asset-based wealth			23.14‡
Low	94.9	5.1	
Medium	97.7	2.3	
High	97.9	2.1	

Continued

Table 1 Continued

Characteristics	Disability status		Rao-Scott χ^2
	No	Yes	
	Prevalence (95% CI)	Prevalence (95% CI)	
Prevalence (95% CI)	97.8 (97.6 to 98.1)	2.1 (1.2 to 2.4)	
	Weighted %	Weighted %	

Rao-Scott is a design-based X^2; p value notation.
*P value <0.05.
†P value <0.01.
‡P value <0.001.
§F-test estimates from equality mean test: p value notation.
GAR, Greater Accra Region; HH, household.

Sex differential analysis indicated that the prevalence of disability among males was approximately twice that of females as estimated from Poisson (adjusted prevalence ratio (aPR) (95% CI)=1.94 (1.46 to 2.57)) and logistic (adjusted OR (aOR) (95% CI)=2.32 (1.73 to 3.12)) regression models. Male sex increased the log odds of disability by 0.37 times (aβ (95% CI)=0.37 (0.23 to 0.50)). Age differential showed that the likelihood of experiencing disability increased with age. Additionally, participants who were separated/divorced, widowed and never married were more likely to experience disability, with an increased log ratio and log odds compared with married participants (table 2).

The number of weeks engaged in working activity over the past 12 months revealed that participants who were engaged within 1–9 weeks were 55% and 69% more likely to experience disability as estimated from Poisson (aPR (95% CI)=1.55 (1.01 to 2.39)) and logistic (aOR (95% CI)=1.69 (1.12 to 2.56)) regression models, respectively, with an increased probability log odds of 0.26 (aβ (95% CI)=0.26 (0.06 to 0.44)) from probit regression analysis. The prevalence of disability among one-person HH was more than twofold compared with HH with 5+ persons (Poisson estimate: aPR (95% CI)=2.18 (1.38 to 3.44)) and (logistic estimate: aOR (95% CI)=2.33 (1.43 to 3.79)), while the log odds shows an increase per unit of 0.38 (aβ (95% CI)=0.38 (0.16 to 0.61)). HHs with two to four persons were 53% and 64% more likely to experience disability compared with 5+ persons as estimated by Poisson and logistic regression models, respectively, with an increased log odd of 0.20 as estimated by probit model (table 2).

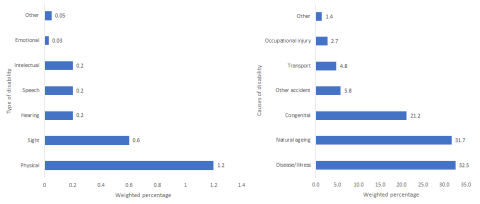

Figure 1 Prevalence of type of disability and cause among Ghanaian labour force, GSS[5].

The regional disparity was evident as participants residing in Brong Ahafo, Northern and Upper East regions experienced the likelihood ratios and odds of disability approaching fourfolds compared with those residing in Greater Accra Region (GAR). The prevalence of disability in the three regions was approximately fourfold the prevalence of GAR. Rural–urban differential demonstrated a disadvantage among urban residents compared with rural residents. Participants' relationship to HH indicated that children were nearly five times more likely to have a disability compared with the HH head (aPR (95% CI)=4.90 (2.99 to 8.02) and aOR (95% CI)=4.94 (2.76 to 8.84)), and the log odds of disability among HH children was 0.77 compared with HH head (aβ (95% CI)=0.77 (0.51 to 1.03)) (table 2).

Analysis of weekly work hours indicated that participants who reported no hours of work within 7 days were more than twice likely to have a disability compared with participants who engaged in 30+ hours of work. Regarding asset-based wealth, participants with a low level of assets were 48% and 66% more likely to have a disability compared with participants rated with a high level of assets (aPR (95% CI)=1.48 (1.01 to 2.17) and aOR (95% CI)=1.66 (1.12 to 2.46)), while the log odds from probit model predicted an increase in disability per unit increase of 0.25 (aβ (95% CI)=0.25 (0.07 to 0.44)) (table 2).

Modified Poisson multivariate decomposition analysis of sex differential among PWD in Ghana's workforce, GSS 2015

Rao-Scott independent test of proportion showed significant association between sex differential and all demographic characteristics (p value ≤0.05) except: age group and region of residence (p value >0.05) (online supplemental table 2).

Overall, the combined effect due to proportional characteristics involved in the study significantly increased the log-likelihood ratio of disability sex differential by approximately 37.5×10^{-3} ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=−37.481 (−56.81 to 18.16)). However, the combined effect of coefficient showed a decreased log-likelihood ratio of sex differential in the prevalence of disability by 42.3×10^{-3}, representing

Table 2 Demographic characteristics associated disability in Ghana's workforce[5]

Demographic characteristics	Poisson	Logistic	Probit
	aPR (95% CI)	aOR (95% CI)	aβ (95% CI)
Sex			
Female	Ref	Ref	Ref
Male	1.94 (1.46 to 2.57)‡	2.32 (1.73 to 3.12)‡	0.37 (0.23 to 0.50)‡
Age group (years)			
≤19	Ref	Ref	Ref
20–29	3.23 (1.43 to 7.26)‡	2.75 (1.32 to 5.69)†	0.50 (0.21 to 0.78)‡
30–39	7.57 (2.99 to 19.12)‡	8.79 (3.77 to 20.51)‡	0.97 (0.63 to 1.32)‡
40+	38.90 (15.9 to 94.7)‡	48.5 (20.7 to 113.1)‡	1.66 (1.32 to 2.01)‡
Marital status			
Married	Ref	Ref	Ref
Separated/divorced	2.04 (1.37 to 3.03)‡	2.00 (1.26 to 3.15)†	0.30 (0.08 to 0.52)†
Widowed	2.21 (1.55 to 3.15)‡	2.80 (1.89 to 4.13)‡	0.49 (0.30 to 0.68)‡
Never married	2.37 (1.32 to 4.27)‡	2.15 (1.17 to 3.95)†	0.23 (–0.04 to 0.50)
Educational level			
None	Ref	Ref	Ref
Primary/JHS	0.87 (0.66 to 1.16)	0.82 (0.61 to 1.11)	–0.08 (–0.21 to 0.06)
SHS/higher	0.87 (0.62 to 1.21)	0.81 (0.58 to 1.15)	–0.10 (–0.26 to 0.06)
Currently working			
No	Ref	Ref	Ref
Yes	0.79 (0.56 to 1.12)	0.85 (0.61 to 1.19)	–0.09 (–0.25 to 0.06)
Weeks engaged in work/12 months			
None	Ref	Ref	Ref
1–19	1.55 (1.01 to 2.38)*	1.69 (1.12 to 2.56)*	0.26 (0.06 to 0.44)†
20+	1.42 (1.06 to 1.89)*	1.66 (1.23 to 2.25)‡	0.24 (0.10 to 0.38)‡
Religion			
Christian	Ref	Ref	Ref
Islam	0.70 (0.49 to 0.99)*	0.75 (0.51 to 1.10)	–0.12 (–0.29 to 0.06)
Other	0.89 (0.59 to 1.33)	0.88 (0.60 to 1.29)	–0.04 (–0.23 to 0.13)
HH size			
5+ persons	Ref	Ref	Ref
1 person	2.18 (1.38 to 3.44)‡	2.33 (1.43 to 3.79)‡	0.38 (0.16 to 0.61)‡
2–4 persons	1.53 (1.10 to 2.12)†	1.64 (1.18 to 2.27)†	0.20 (0.05 to 0.35)†
Region			
GAR	Ref	Ref	Ref
Western	2.37 (1.10 to 5.09)*	2.71 (1.19 to 6.16)*	0.49 (0.13 to 0.83)†
Central	1.69 (0.85 to 3.37)	2.06 (1.05 to 4.05)*	0.34 (0.04 to 0.63)*
Volta	2.47 (1.36 to 4.48)†	3.18 (1.72 to 5.90)‡	0.57 (0.31 to 0.84)‡
Eastern	1.79 (0.99 to 3.23)	2.53 (1.35 to 4.76)†	0.45 (0.18 to 0.72)‡
Ashanti	2.00 (1.07 to 3.73)*	2.47 (1.32 to 4.61)†	0.45 (0.18 to 0.71)‡
Brong Ahafo	3.45 (1.89 to 6.32)‡	4.01 (2.17 to 7.41)‡	0.64 (0.37 to 0.90)‡
Northern	3.04 (1.58 to 5.86)‡	3.78 (1.83 to 7.79)‡	0.65 (0.32 to 0.98)‡
Upper East	4.04 (2.17 to 7.51)‡	5.52 (2.83 to 10.7)‡	0.81 (0.52 to 1.10)‡
Upper West	1.76 (0.84 to 3.68)	2.21 (1.01 to 4.84)*	0.40 (0.06 to 0.74)*
Place of residence			

Continued

Table 2 Continued

Demographic characteristics	Poisson	Logistic	Probit
	aPR (95% CI)	aOR (95% CI)	aβ (95% CI)
Rural	Ref	Ref	Ref
Urban	1.38 (1.04 to 1.84)*	1.41 (1.04 to 1.91)*	0.16 (0.01 to 0.30)*
Relationship to HH			
HH head	Ref	Ref	Ref
Spouse	1.66 (1.07 to 2.56)*	1.67 (1.06 to 2.61)*	0.22 (0.02 to 0.42)†
Child	4.90 (2.99 to 8.02)‡	4.94 (2.76 to 8.84)‡	0.77 (0.51 to 1.03)‡
Other	3.89 (2.67 to 5.65)‡	4.56 (2.94 to 7.06)‡	0.77 (0.55 to 0.99)‡
Place of birth			
Different village	Ref	Ref	Ref
This village	1.23 (0.96 to 1.57)	1.15 (0.87 to 1.51)	0.06 (–0.07 to 0.19)
Engaged in non-farm activity within 7 days			
No	Ref	Ref	Ref
Yes	1.23 (0.79 to 1.92)	1.11 (0.73 to 1.69)	0.04 (–0.15 to 0.22)
Did any work for pay within 7 days			
No	Ref	Ref	Ref
Yes	0.63 (0.34 to 1.17)	0.64 (0.34 to 1.18)	–0.18 (–0.43 to 0.07)
Hours of work within 7 days			
30+	Ref	Ref	Ref
None	2.43 (1.49 to 3.95)‡	2.30 (1.41 to 3.74)‡	0.34 (0.13 to 0.55)†
1–29	1.19 (0.75 to 1.90)	0.94 (0.61 to 1.45)	–0.05 (–0.23 to 0.14)
Visited any place outside HH			
No	Ref	Ref	Ref
Yes	0.87 (0.63 to 1.21)	0.93 (0.69 to 1.25)	–0.02 (–0.16 to 0.11)
Assest-based wealth			
High	Ref	Ref	Ref
Low	1.48 (1.01 to 2.17)*	1.66 (1.12 to 2.46)*	0.25 (0.07 to 0.44)†
Medium	0.94 (0.63 to 1.39)	0.99 (0.64 to 1.51)	0.01 (–0.18 to 0.19)

aPR is adjusted prevalence ratio; aOR is adjusted OR; aβ is normalised coefficient; p value notation.
*P value <0.05.
†P value <0.01.
‡P value <0.001.
GAR, Greater Accra Region; HH, household; Ref, reference category.

($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=42.31 (21.11 to 63.49)) (table 3). Age group, marital status, HH size, region, place of residence, relationship to HH, hours of work/7 days and asset-based wealth were significantly associated with the sex differential in the prevalence of disability (table 3).

To attain a reduction of sex differential in disability prevalence rate, the proportion of characteristics involved (endowment) estimated a significant association with 40+ years age group ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=4.09 (2.67 to 5.52); 84.9%), never married ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=6.15 (0.53 to 11.77); 127.5%), northern region as place of residence ($\beta\times10^{-3}$ (95% CI)=0.57 (0.27 to 0.88); 11.9%) and children as status of HH relationship ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=0.88 (0.37 to 1.39); 18.3%).

Estimates of differences in demographic characteristics due to endowment indicate that the 30–39 age group ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=–1.53 (–2.33—0.73); –31.7%), marital status as separated/divorced and widowed ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=–2.42 (–3.91 to –0.94); –50.3% and –5.75 (–9.68 to –1.81); –119.3%), urban place of residence ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)= –69 (–1.25 to –0.14); –14.4%), HH relationship status as spouse ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=–33.47 (–52.21 to –14.73); –694.2%), no hours worked within 7 days ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=–2.72 (–4.37 to –1.07)) and low asset-based wealth ($\beta\times10^{-3}$ (95% CI$\times10^{-3}$)=–1.48 (–2.57 to –0.38); –30.6%) were significantly associated with an increased sex differential in the prevalence of disability (table 3).

Table 3 Sex differential multivariate decomposition analysis of disability showing differences of demographic characteristics attributable to endowment and differences due to coefficient[5]

Demographic characteristics	Endowment		Coefficient	
	aβ (95% CI)	Pct	aβ (95% CI)	Pct
Age group (years)				
≤19	Ref		Ref	
20–29	−0.67 (−1.71 to 0.37)	−13.9	−8.40 (−28.31 to 11.52)	−174.3
30–39	−1.53 (−2.33 to −0.73)‡	−31.7	1.36 (−17.05 to 19.78)	28.3
40+	4.09 (2.67 to 5.52)‡	84.9	5.37 (−24.36 to 35.11)	111.5
Marital status				
Married	Ref		Ref	
Separated/divorced	−2.42 (−3.91 to −0.94)‡	−50.3	1.20 (−2.28 to 4.68)	24.9
Widowed	−5.75 (−9.68 to −1.81)†	−119.3	−2.30 (−6.69 to 2.09)	−47.8
Never married	6.15 (0.53 to 11.77)*	127.5	−0.60 (−14.81 to 13.62)	−12.3
Weeks engaged in work/12 months				
None	Ref		Ref	
1–9	−0.06 (−0.13 to 0.02	−1.2	−3.00 (−8.06 to 2.05)	−62.3
20+	−0.40 (−0.99 to 0.20)	−8.4	−5.29 (−12.96 to 2.38)	−109.7
HH size				
5+ persons	Ref		Ref	
1 person	5.14 (0.22 to 10.06)*	106.6	−1.39 (−6.04 to 3.25)	−28.9
2–4 persons	−3.47 (−7.04 to 0.11)	−71.9	−2.12 (−15.70 to 11.45)	−44.0
Region				
GAR	Ref		Ref	
Western	0.16 (−0.15 to 0.47)	3.3	−6.00 (−12.14 to 0.13)	−124.5
Central	−0.08 (−0.36 to 0.21)	−1.6	−4.58 (−10.31 to 1.14)	−95.1
Volta	−0.44 (−0.80 to −0.08)*	−9.2	−3.12 (−8.57 to 4.26)	−64.8
Eastern	0.20 (0.00 to 0.40)*	4.1	−2.15 (−8.57 to 4.26)	−44.7
Ashanti	−0.33 (−0.57 to −0.09)†	−6.9	−0.89 (−11.62 to 9.83)	−18.5
Brong Ahafo	−0.01 (0.003 to 0.22)†	−0.2	−2.39 (−7.31 to 2.52)	−49.7
Northern	0.57 (0.27 to 0.88)‡	11.9	0.73 (−4.04 to 5.54)	15.2
Upper East	0.27 (0.13 to 0.41)‡	5.6	−0.46 (−2.47 to 1.55)	−9.6
Upper West	−0.04 (−0.07 to 0.00)*	−0.8	0.04 (−1.69 to 1.77)	0.7
Place of residence				
Rural	Ref		Ref	
Urban	−0.69 (−1.25 to −0.14)*	−14.4	9.55 (−4.09 to 23.19)	198.2
Relationship to HH				
HH head	Ref		Ref	
Spouse	−33.47 (−52.21 to −14.73)‡	−694.2	14.19 (−7.51 to 35.91)	294.5
Child	0.88 (0.37 to 1.39)‡	18.3	−3.52 (−11.11 to 4.07)	−73.0
Other	−1.23 (−1.91 to −0.55)‡	−25.5	−0.79 (−3.75 to 2.17)	−16.3
Hours of work/7 days				
30+	Ref		Ref	
None	−2.72 (−4.37 to −1.07)‡	−56.4	6.59 (−9.30 to 22.47)	136.6
1–29	0.02 (−0.19 to 0.23)	0.5	2.31 (−8.14 to 12.77)	47.9
Asset based wealth				
High	Ref		Ref	

Continued

Table 3 Continued

Demographic characteristics	Endowment		Coefficient	
	aβ (95% CI)	Pct	aβ (95% CI)	Pct
Low	−1.48 (−2.57 to −0.38)†	−30.6	4.04 (−9.19 to 17.27)	83.9
Medium	0.05 (−0.62 to 0.72)	1.0	0.41 (−10.09 to 10.92)	8.6
Overall	−37.48 (−56.81 to −18.16)‡		42.31 (21.11 to 63.49)‡	
Pct	−777.5		877.5	

Pct denotes percentage involvement from Poisson multivariate decomposition analysis of disability-based sex differential; p value notation.
*P value <0.05.
†P value <0.01.
‡P value <0.001.
GAR, Greater Accra Region; Ref, reference category.

DISCUSSION

This analysis established the factors significantly associated with persons living with disability in Ghana. Adjusting for all covariates, sex differences, age group, marital status, weeks engaged in work/12 months, HH size, region, place of residence, relationship to HH, hours of work per week and asset-based wealth were significantly associated with disability. Almost all individuals with disability were challenged with limitation in full participation in life activities (such as mobility, work and social life). This translates into their daily functional status as highly dependent.

The prevalence of disability was 21 persons with disability per 1000 population, which is higher than previously reported in Ghana[23 24] as well as in similar settings outside Ghana.[25] However, the rate is lower than rates reported among rural Malaysians (24.7%)[26] and in India (21 disability cases per 1000).[27] Sampling techniques and type of population involved in these studies are likely to have accounted for these differences.

This analysis included various types of disabilities such as physical, sight, hearing, speech, intellectual, emotional and others. The potential risk factors of these disabilities in ascending order were disease/illness, natural ageing, congenital, non-traffic-related accidents, transport and occupational injury. The preponderance of these risk factors conforms with previous reports from Ghana among prisoners. However, among the prison population, the common causes of disability were traumatic injuries, infection and drug-related mental disability.[23]

Our findings indicated that with increasing age, the prevalence of disability increased, a finding that conforms to results from a previous study conducted in Ethiopia[25] and from other low-income and middle-income countries.[28] Chronic health conditions fall, and injuries and degenerative health conditions predispose the older adult to disabilities.[29]

Interestingly, being single (ie, separated/divorced, widowed and never married) was associated with increased risk of disability—a twofold increase compared with married participants. This could probably be as a result of risky lifestyle among single workforce with the notion of no dependence.[30 31] This is in agreement with the Ethiopian study that reported a significantly higher prevalence of disability among separated persons relative to their married counterparts.[25] Also, this observation is supported by a more global assessment among 57 countries across the world.[32] Partners selection and individual choices may influence this, in that persons with disabilities (cognitive impairment or mobility limitations) may be less attractive to potential partners.[33]

The number of hours engaged in working activities over the past week was identified to be associated with disability and in consonance with Vahtera *et al*[34], who established an association between worktime control and future disability. More active participants were less likely to have disabilities, which is not surprising because disability places limitations on the capacity of an individual to work and could result in the individual being laid off from work.

Rural–urban differential indicated a higher prevalence of disability among rural residents. This may likely be related to the type of occupation among the rural-dwelling participants. They are mainly involved in farming and related activities, a physically tasking occupation with a high risk of locomotor and spinal effects.

The asset-based wealth revealed an inverse relationship where there was a decreasing prevalence of disability with increasing asset ownership herein referred to as 'asset-based wealth'. In particular, those with low level of assets were more likely to report disability. This finding is not different from findings reported in earlier studies.[22 26] Person living in poverty may work under hazardous condition associated with adverse health outcomes including disability. They may also have limitations of access to healthcare and education, which predisposes them to the risk of developing disability.[35]

Sex difference existed in the prevalence of disability among the workforce studied and showed a male preponderance (almost twice as likely to experience disability compared with their female counterparts). The result established that the overall sex differential of disability among Ghanaian labour was significantly explained by the difference in the social determinant of disability. The analysis shows that overall differences of the social

determinants of disability increased disability sex differential significantly, while the overall effect of the social determinant of disability among males and females decreased significantly. A potential explanation could also be the engagement of males in risky activities and more physically tasking occupations (mining, petrochemical, electrical and telecommunications, climbing and working on pylons, commercial driving and so on).

LIMITATIONS

The results of this study could not establish the effect of the associated sex differences considered individually. This study is only relevant for population-based characteristics and cannot be applied to individuals. Moreover, the primary outcome variable was self-reported and not based on objective measurement. However, the findings in the study are in agreement with other local[24] and international[26 32] studies where objective measurements have been applied. In addition, biomarkers, questions or measurements related to chronic health conditions might have enhanced the assessments (these were, however, not included in the primary data from the LFS).

CONCLUSION

The various forms of disability were: physical, sight, hearing, speech, intellectual, emotional and accident and the causes include: disease/illness, natural ageing, congenital, accident and occupational injury. The magnitude of experiencing disability among males was almost twice that of females. The sex differences of disability were significantly associated with age group, marital status, HH size, region and place of residence, relationship to HH, hours of work within the past week and asset-based wealth. Almost all disability participants were challenged with activities of daily living, limiting them in full participation in life activities such as mobility, work and social life. These findings amass the provisional needs of persons living with disability, which are indicators to consider to achieve the United Nations Convention on the Rights of Persons with Disabilities Article 10 (*States Parties reaffirm that every human being has the inherent right to life and shall take all necessary measures to ensure its effective enjoyment by persons with disabilities on an equal basis with others*). In addition, formulation of workplace policies and indicators should adopt a gender-sensitive approach to reduce disparities and eliminate disability in the target population. This analysis further recommends the inclusion of biomarkers and chronic health conditions in large-scale assessment of the labour force survey.

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