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Working conditions of male and female artisanal and small-scale goldminers in Ghana: Examining existing disparities

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ABSTRACT

Artisanal and small scale mining (ASM) provides a livelihood to more than 100 million men and women worldwide, mostly in the global south. Although the sector is male-dominated, the number of women engaged in its activities has increased dramatically in recent years, underscoring the need for critical assessment of their environmental, health and safety working conditions. Based on a cross-sectional survey of 482 male and 106 female artisanal and small-scale goldminers in Ghana, this study examines the disparities in the mean scores of the environment, health, safety and economic working conditions between male and female goldminers. Using four counterfactual decomposition techniques, inequality in working conditions was disaggregated according to group differences in the magnitudes of the determinants and group differences in the effects of the determinants. The difference in the mean values of the estimated coefficients accounts for much of the difference in environment, health, safety, and economic working conditions between the male and female artisanal and small-scale goldminers. This implies that the gap in working conditions between the two groups may be attributed to discrimination, but it may also emanate from the influence of unobserved variables. Gender-specific differences exist for the artisanal and small-scale goldminers surveyed: age and years of experience are salient for men, whereas education and number of years lived in the community are more important for women.

1. Introduction

Artisanal and small-scale mining (ASM) occurs in 80 countries, across which, collectively, the total number of people engaged in the activity has grown from 10 million in 1999 to potentially more than 20–30 million today (Buxton, 2013). Artisanal and small-scale miners account for 80% of global sapphire, 20% of global gold and up to 20% of world diamond production (World Bank, 2009). They are found scattered across sub-Saharan Africa, Asia, Oceania, and Central and South America. Although their largely-informal and, on the whole, relatively un-mechanized, nature generally results in low productivity, the sector is an important livelihood and income source for a host of impoverished individuals (Banchirigah and Hilson, 2010; Hilson and McQuilken, 2014). Worldwide, at least 100 million people – workers and their families – depend on ASM, compared to only seven million people in the case of industrial mining (World Bank, 2009).

It is a complex industry that is highly-important economically in at least 23 countries in sub-Saharan Africa. There is growing recognition that ASM is the most significant economic activity in many of the region's rural settings (see Banchirigah and Hilson, 2010; Hilson and McQuilken, 2014). Here, most ASM activities are dynamic, populated by individuals who carry out different tasks, responsibilities which are often determined by gender (Hinton et al., 2003). In most artisanal and small-scale gold mining communities in sub-Saharan Africa, men undertake jobs related to actual ore extraction, such as digging, blasting, crushing stones and loading and transporting ore (Armah et al., 2013a). They are less present in the processing stage, and play a relatively minimal role in the delivery of auxiliary services. Women, on the other hand, tend to dominate processing (panning, preparing the processing plant) and the provision of auxiliary services (cooking, cleaning,

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buying gold). The former features high levels of manual activity to extract mineral remnants from tailings; women form 'human chains', each carrying large buckets of tailings on their heads, and panning and sluicing mud and sand to recover particles of gold. It is not uncommon to see children by their sides. Women's tasks are the most labour-intensive yet yield the lowest economic returns. Given the nature of ore processing, they and their children commonly inhale dust, which can lead to respiratory disease. Moreover, they often become exposed to mercury and in some cases, toxic cyanide, when it is used to reprocess tailings. But they also haul ore with windlasses, sort stones/tailings, and bag ore (Armah et al., 2013a). The general gender division of labour reflects the perceived appropriateness of tasks for both women and men (Heemskerk, 2003).

In sub-Saharan Africa, overall, the majority of benefits from small-scale gold mining accrue to men, while most of the occupational health risks and vulnerabilities associated with this activity are borne by women (see Jenkins, 2014; Gier and Mercier, 2006). Across the region, large numbers of women participate in the – largely-informal – small-scale gold mining economy, which also supports multiple dependents through allied livelihoods. Yet, little is known about the working conditions of both its male and female operators, and how these vary systematically with educational level, age, and years of experience on the job. It is no secret that artisanal and small-scale miners often operate in hazardous working conditions. Major health risks associated with artisanal mining include exposure to dust (silicosis, mesothelioma); exposure to mercury, zinc vapour, cyanide, acids, and other chemicals (Obiri et al., 2010); and over-exertion, problems arising from working in an inadequate workspace and complications associated with using inappropriate equipment. Due to a lack of engineering expertise and capital, there are many accidents at sites, mostly caused by rock falls and subsidence, a lack of ventilation, misuse of explosives, and obsolete and poorly-maintained equipment (Lahiri-Dutt, 2008). It has been suggested that women bear the brunt of these impacts because of their dual roles as primary carers and being responsible for the health of their families (Hinton et al., 2003; Jenkins, 2014). They are vulnerable to contamination from mercury and other heavy metals in water and the work environment; mercury exposure is known to severely impair foetal development (Hinton et al., 2003). Notwithstanding this, it is unclear how length of stay of artisanal and small-scale goldminers in the community mediates the relationship between working conditions and the compositional attributes of these individuals.

This paper aims to address these gaps by examining the disparities between the working conditions of male and female artisanal and small-scale goldminers. The analysis focuses on Ghana, where the number of artisanal and small-scale goldminers has risen sharply since the 1990s (Armah et al., 2013b). Ghana is the second largest African gold producer and the ninth largest globally; artisanal and small-scale miners account for a significant amount of this production (Wilson et al., 2015). Based on official statistics from the Ghana Extractive Industries Transparency Initiative (GHEITI), in 2013 and 2014, gold from ASM accounted for approximately 34% of total gold production (MOF, 2014).

In Ghana, as in many parts of sub-Saharan Africa, women often experience discrimination at small-scale gold mines. Employment and training opportunities are typically prioritised for men and women are only allowed to work in the most menial, low-paid positions (Tallichet et al., 2006). Maternity leave may not be granted and women returning from childbirth or caring for children may struggle to regain employment. According to Tolonen (2014), our understanding of the welfare effects of natural resource use, in general, and by extension, gold extraction, is rather limited, especially at the local level. The 2010 Ghana Population and Housing Census figures on gender participation proportion in mining stood at 0.6% for females compared to 2% for males (Ghana Statistical Service, 2010; Rufai et al., 2014).

2. Theoretical context

Artisanal and small-scale miners face a number of environmental and health-related threats, most of which have been examined extensively in the literature. Complications can arise from overexposure to the very fine mineral dust particles generated from blasting and drilling. These particles can accumulate in the lungs, causing pneumoconiosis (Castilhos et al., 2015; Long et al., 2015), as well as the irreversible disease silicosis, which is induced by excessive inhalation of crystalline silica or quartz (Gottesfeld et al., 2015; Oni and Ehrlich, 2015). In ASM, exposure to mercury is of critical concern. This heavy metal is found in about 25 organic mineral compounds. Workers can inhale, swallow or absorb mercury through their skin. Even exposure to small quantities can, over time, cause severe poisoning. Symptoms of mercury poisoning include weakness, mouth ulcers, bleeding gums and loose teeth, tremors, nausea, abdominal pain, headaches, diarrhoea and cardiac weakness (Long et al., 2015; Rajaee et al., 2015). In addition, small-scale mine production features noisy process, and unfiltered noise emanating from equipment, such as drills, crushers and engines can lead to temporary or permanent hearing loss, speech interference and eardrum rupture (Green et al., 2015; Long et al., 2015). Back injuries from lifting and shovelling as well as slips and falls are additional health and safety risks facing artisanal and small-scale miners. There are, however, gender-based heterogeneities evident in the exposure to these hazards.

Gender is a fundamental marker of social and economic stratification linked to exclusion. In the context of this paper, unless otherwise stated, gender refers explicitly to the behaviour, attitudes, values and beliefs that a particular sociocultural group considers appropriate for males and females. It is often suggested that gender roles are fluid and can shift over time, space and in different contexts (see Butler, 1990; Hinton et al., 2003). Notwithstanding one's socioeconomic class, there can be systematic gender differences in material wellbeing, although the degree of inequality varies across countries and over time (Meinzen-Dick et al., 2014). Gender inequality is prevalent in most societies, with males on average better positioned in social, economic, and political hierarchies (Meinzen-Dick et al., 2014; Ridgeway, 2011).

The accentuation of the complexities in the social relationships that shape our understanding of what it means to be male and female – both individually and collectively, and the notion of agency, or conscious choice – distinguish the model of the social construction of gender from all others (Davis et al., 2006; Lorber, 1994; Risman et al., 2012). Gender defines and determines roles, rights, responsibilities, and obligations in a society. The innate biological differences between females and males form the basis of social norms that define appropriate behaviour for women and men and determine the differential social, economic, and political power between the sexes (O'Shaughnessy and Krogman, 2011; Ridgeway and Correll, 2004). At the beginning of the twenty-first century, these differing norms still mostly favour men and boys, giving them more access than women and girls to the capabilities, resources, and opportunities that are important for the enjoyment of social, economic, and political power and well-being (Meinzen-Dick et al., 2014; Ridgeway, 2011).

In the literature (see Meinzen-Dick et al., 2014; UN Millennium Project, 2005), the systematic disadvantage women face is framed in terms of capabilities, access to resources and security dimensions. Capabilities (Anand et al., 2010) are basic human abilities as measured by education, health, and nutrition. These are