

Health risks and informal employment in South Africa: does formality protect health?

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Background: The association between work and health has not been well explored in the context of economically developing countries, largely due to inadequate data.

Objectives: The objective of this study was to identify the association between informal wage work and health in South Africa using a newly available data set that includes detailed information on both employment and health.

Methods: To explore the relationship between formality, work, and health in South Africa, data from the first (2008) wave of the National Income Dynamic Study (NIDS) were analyzed. We constructed a “formality index” which represents work arrangements on a continuum of formality to informality allowing for a more nuanced analysis of the association between wage work and health.

Results: We found that formality of employment was significantly associated with health in South Africa, but that the protective effect of formality in employment on health was largely derived from the higher levels of income earned through more formal types of employment. Nevertheless, we did find that the association between informality and poor health was significantly greater for women in wage employment than for males.

Keywords: Informal sector, Informal economy, Employment, Formality index, Health status, South Africa

Introduction

Prior research has found a positive association between socio-economic status and health.^{1,2} Although there is not always full agreement, there is substantial evidence to show that poor socio-economic status and low incomes are often associated with poorer health outcomes and *vice versa*.^{3–5} However, significantly less attention has been paid to the association between work and health, even though the work process and environment are both social determinants of health, defined by the World Health Organization as the conditions which affect health and which are shaped “by the distribution of money, power and resources at global, national and local levels.”^{5–7} Job insecurity and temporary employment arrangements have been linked to higher injury rates, psychosocial stress, worse mental health outcomes, and lower self-reported health status as workers have less control over their physical work environments, less access to adequate training, and less ability to control their working hours.^{8,9}

A large proportion of the evidence linking health outcomes to work has been generated from data available in economically developed countries. In economically developing countries, where levels of job formality are much lower, relatively little work has been done on the relationship between health and work. The difficulties of capturing accurate information from large numbers of informal workers, combined with under-resourced national occupational accident and disease reporting systems, makes it difficult to develop a quantitative description of this relationship. It is also difficult to draw a clear line between the impact of employment and generally low living standards on health outcomes. Studies that do exist are often occupation and/or workplace specific epidemiological surveys (or qualitative studies) and are too time and context specific to provide a comprehensive view of the correlation between work and health. These limitations also make it difficult to compare the health status of workers employed under different labor market conditions.¹⁰

Nevertheless, there is evidence which points to an association between work and negative health outcomes.^{11–13} Workers who are precariously employed in industrialized countries lack labor protections, but

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they are more likely to work in regulated workplaces. This is not the case for most informal workers in developing countries because they work in unconventional places including homes, roadsides, unregulated factories, and rural areas where state regulation fails to reach. These workers suffer from many of the same problems as precariously employed workers in industrialized countries. They are unlikely to have formal sick leave and may have inordinately long working hours which can exacerbate both mental and physical ill-health.¹⁴ Two studies from Brazil have shown that a lack of labor protections was associated with an increased risk of poor mental health for women workers.^{15,16} Additionally, informal workers are exposed to workplaces which are themselves often poorly or not regulated, unhealthy, and unsafe, and which can have a negative impact on their health.^{12,14,17}

Not all studies have shown a difference between formal and informal wage employment and health outcomes. A Brazilian study showed that there was little difference in the cumulative rates of work-related injury among two groups of informal workers and the cumulative rates of work related injury reported nationally.¹⁸ It has been argued that this a result of generally low levels of compliance to workplace health and safety regulations even in formal workplaces in Brazil, which means that many formal workers are often just as exposed to poor working conditions as informal workers.¹¹

The objective of this study was to identify the association between informal wage work and health in a developing country context with a newly available data set that includes detailed information on both employment and health. Such data sets are relatively rare — with many large-scale surveys focusing either on working conditions or health. While a number of studies in South Africa have shown a relationship between general socio-economic status and health outcomes, few have focused on the relationship between employment status (formal versus informal) and health outcomes.^{4,19} An exception to this is work by Lund and Ardington in Kwamsame, a periurban area of KwaZulu-Natal.¹⁰ Their small-scale survey showed a clear relationship between the formality of wage employment and self-reported health, with health status improving as formality increased. This study aims to build on this study by adapting their methodology to a study of wage workers from a large, nationally representative data set.

Background: Wage Work in the South African Context

Wage work, which differs from self-employment, makes up a significant proportion of total employment

in South Africa due largely to the labor intensive industrialization promoted under the Apartheid regime. The subsequent process of de-industrialization in South Africa today has led to a rise in informal employment.⁸ However, in contrast to many other developing countries, the South African informal economy is still characterized by a high proportion of wage employment as opposed to self-employment; 67.5% of those employed work for a regular wage (author's own calculations from National Income Dynamics Study, 2008).

South Africa also differs from many other developing countries in that its informal economy contributes a relatively small amount to total employment, with only about a third (33%) of workers being classified as informal workers.²⁰ There is a high unemployment rate, which sits at 25.2% at the “standard definition” (which excludes discouraged job seekers from the definition of the unemployed) and 35.9% at the “expanded definition” (which includes the discouraged job seekers).²¹ It is also a highly regulated country with relatively good provision of basic services such as sanitation and waste management, although these tend to be unevenly distributed.²² The presence of a relatively sound basic services infrastructure does mean that working conditions in informal workplaces are likely to be better than in countries where such services are lacking.

Defining wage employment in the informal economy in South Africa is complicated by the multiplicity of ‘atypical’ employment arrangements that can be found in developing country labor markets. For example, informal wage workers may be found working for informal enterprises in unconventional and unprotected places of work such as roadsides, informal marketplaces, and landfills, or they may be working under formal labor regulations (such as domestic workers), but in atypical places of work such as private residences which are difficult to regulate and monitor, or they may work in formal workplaces, but under an informal arrangement that does not provide labor protections. It is this last category of informal worker that forms a “large and growing percentage” of informal wage employment in South Africa, although domestic work (which is formally regulated in South Africa, but takes place in private residences) is still an important source of employment for women²³ (authors' own calculations from the National Income Dynamics Study, 2008).

In each of these configurations, there are differing levels of protection, making it difficult to classify them under the single heading of informal wage work. Recognizing this difficulty, Standing developed a “formality index,” representing work arrangements on a continuum of formality to informality, challenging

the formal/informal dichotomy.¹⁰ In South Africa, this approach has been developed further by Budlender, Buwembo and Shabalala, Ardington and Leibbrandt, and Lund and Ardington.^{10,24,25} These studies have shown these indices to be particularly useful in developing a more nuanced understanding of a workforce that does not fit into one defined category.

The distinctive characteristics of the South African labor market means that it is not possible to generalize the findings of this study across all economically developing countries. Nevertheless, the South Africa context does differ substantially from the countries of the Global North, and has some similarities to countries in Latin America such as Brazil, where the informal economy plays a significant role in employment. The relatively advanced data collection systems in countries like Brazil and South Africa, compared to many countries with very large informal economies, allow for an exploration of the association between work and health in a non-economically developed country context.

Methods

To explore the relationship between formality, work and health in South Africa, data from the first (2008) wave of the National Income Dynamic Study (NIDS) were analyzed. NIDS is a nationally representative household panel survey, administered to 25 255 individuals from 6893 households. One of the unique features of NIDS is that it enumerated *individuals* rather than relying on the traditional household survey format in which a single householder (often the household head) provides information on all other household members. As a result, NIDS provides a rich source of data at the individual level of analysis. This is particularly important for the present study which makes use of a measure of self-reported health.

The NIDS questionnaire contains a comprehensive module on labor force participation, as well as detailed questions about the nature of employment, working conditions, and earnings. NIDS captures information on four categories of work: regular wage work, self-employment, casual work, and subsistence farming. Using the questions on employment, a number of work-related conditions for regular wage workers were identified.

To construct a measure of formality associated with wage work (i.e. regular employment), we follow a number of other studies in aggregating a range of attributes of formal work (summarized in Table 1) from the NIDS data.^{10,24,26,27} The reliability of these 11 job attributes in measuring a single latent construct (i.e. formality) was tested by calculating Cronbach's alpha. The coefficient produced by this test identifies the internal consistency or the average

correlation of items in a survey instrument to gauge its reliability. A coefficient of 0.70 or higher is considered internally consistent.²⁸ The Cronbach alpha coefficient of 0.76 for the 11 items in Table 1 indicates that these attributes are likely to be measuring the same underlying concept.

In further grouping this (unweighted) index of formality among wage workers, we follow Lund and Ardington in clustering (using the *k*-medians algorithm) workers into categories of low, medium, and high formality.¹⁰ Based on the clustering analysis, workers are classified as having "low" formality if their job has between zero and four of the indicators in Table 1; "medium" formality if the job has five or six of the indicators; and "high" formality if they have between seven and eleven of the indicators.

Health was assessed in the NIDS by asking respondents to rate their current health on a five-point scale where 1 is described as "excellent" and 5 is "poor." Self-reported assessment of health has been shown to be significantly and positively associated with mortality and is often a good predictor of functional ability.²⁹⁻³¹ The self-reported health scale denotes a much wider and more general measure of health status than questions which capture information on specific chronic illnesses or physical limitations.³⁰

Results

The South African workforce

Table 2 shows the distribution of regular wage workers across the three categories of formality. Almost half (48.4%) of all wage workers in South Africa are low formality workers. Wage employed women (53.3%) are significantly ($P < 0.01$) more likely than men (44.1%) to be in the lowest category of formality. Men are significantly ($P < 0.05$) more likely to be in the medium formality category (27.5% of male wage workers) and marginally more likely to have a high number of formal job attributes (28.4%).

Table 3 shows the distribution of employment categories for the approximately 9.5 million South African workers by gender. The majority of South

Table 1 Indicators of "formality" among regular wage workers

Regular wage work	
1	Acquired job through formal job search
2	Full-time (versus part-time)
3	Regular bonus
4	Other bonus
5	Profit share
6	Employer contribution to pension fund
7	Employer contribution to medical aid
8	Unemployment insurance fund
9	Written contract
10	Permanent contract (versus fixed-term)
11	Member of a trade union

Table 2 Level of formality among regular wage workers in South Africa, by gender

	Women	Men	Total
Low	53.25% (1.82)	44.12% (1.74)	48.35%*** (1.26)
Medium	20.98% (1.52)	27.52% (1.59)	24.49%** (1.11)
High	25.77% (1.65)	28.36% (1.59)	27.16% (1.15)
Total	100.00%	100.00%	100.00%

Note: The data are weighted with post stratification population weights for all analyses. Standard errors in parenthesis. Differences between men and women are statistically significant at: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.10$.

Source: Authors' calculations from NIDS (2008).

African workers (67.5%) receive a regular wage, while nearly 16% are classified as self-employed and 11% are casual workers or subsistence farmers. There are notable gender differences in the employment categories. Women are significantly less likely than men ($P < 0.01$) to receive a regular wage and at the same time more likely ($P < 0.01$) to engage in subsistence agriculture (14.2% of the female workforce).

An important caveat is that the categories of employment from Table 3 are not mutually exclusive and some workers have more than one type of work (not shown in table). However, these numbers are relatively small and wage workers in particular are unlikely to report other types of employment. For example, only 2% of regular wage workers are also self-employed or engage in casual work.

Formality and work in South Africa

Table 4 shows the employment characteristics of regular wage workers in South Africa. Results in this table are consistent with previous research findings on employment. In particular, the fact that almost 10% of employees work in private households (mostly as domestic workers and gardeners) is a traditional

feature of labor force statistics in post-apartheid South Africa. The higher percentage of females working in private households corresponds with results from previous studies in this area and highlights the large presence of women in domestic work.²³ The data also show that most employees do not have a second job (1.7% have two or more jobs), are permanent employees, and have a written employment contract. Almost a third of wage workers are union members, but the percentage is significantly higher for male employees than for women ($P < 0.05$).

Table 5 describes the key characteristics of regular wage workers. Women are over-represented in the low formality category relative to the percentage of women in the workforce or in wage work. Women represent 43% of all wage workers, yet represent 51% of all employees engaged in low formality work. Employees in low formality occupations also report significantly ($P < 0.01$) lower levels of education (8.7 years), are less likely ($P < 0.01$) to be permanently employed or professional workers, are more likely ($P < 0.01$) to engage in elementary work (a third of low formality workers) and work in private households. These findings suggest that, on the whole, workers in the low formality category are less likely to have secure employment and are more likely to be earning lower wages than workers in the medium and high formality categories.

Table 6 shows the benefits that employees receive and suggests that not only are the workers in the low formality category earning less and working in less secure conditions, but the differences between these workers and employees in higher levels of formality are large. Less than 10% of low wage workers have an

Table 3 Employment characteristics of the South African work force by gender

	Women	Men	Total
Regular wage worker	63.41% (1.30)	70.31% (1.24)	67.52%*** (0.90)
Self-employed	16.87% (1.02)	14.45% (1.01)	15.64% (0.72)
Casual worker	10.87% (0.89)	12.55% (0.91)	11.73% (0.64)
Subsistence farming	14.21% (0.82)	8.43% (0.64)	11.27%*** (0.52)
Weighted N	4 663 212	4 865 584	9 528 796

Note: The data are weighted. Standard errors in parenthesis. Differences between men and women are statistically significant at: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.10$. Categories are not mutually exclusive, therefore columns do not total to 100%.

Source: Authors' calculations from NIDS (2008).

Table 4 Employment characteristics of South African wage workers by gender

	Women	Men	Total
Private households	17.90% (1.36)	3.01% (0.65)	9.89%*** (0.74)
Have a second job	1.43% (0.37)	2.00% (0.54)	1.74% (0.33)
Permanent employee	59.70% (1.75)	63.09% (1.69)	61.52% (1.22)
Written contract	62.58% (1.73)	68.70% (1.64)	65.86%* (1.19)
Trade union member	28.27% (1.61)	35.67% (1.69)	32.24%** (1.18)

Note: The data are weighted. Standard errors in parenthesis. Differences between men and women are statistically significant at: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.10$. Categories are not mutually exclusive therefore columns do not total to 100%.

Source: Authors' calculations from NIDS (2008).

Table 5 Key characteristics of South African wage workers by level of job formality

	Low	Medium	High	Total
Female	51.05% (1.76)	39.72%*** (2.56)	43.99%* (2.49)	46.36% (1.26)
Mean years of age	36.79 (0.39)	38.64* (0.56)	40.71*** (0.45)	38.31 (0.27)
Mean years of education	8.72 (0.14)	10.32*** (0.17)	11.86*** (0.15)	9.96 (0.10)
Permanent	33.58% (1.64)	78.78%*** (2.06)	95.71%*** (0.91)	61.52% (1.22)
Elementary work	33.30% (1.61)	11.60%*** (1.65)	7.41%*** (1.26)	20.95% (0.98)
Private household	18.85% (1.37)	2.69%*** (0.94)	0.49%*** (0.32)	9.89% (0.74)
Professionals	7.41% (0.97)	13.49%** (1.63)	27.92%*** (2.26)	14.47% (0.90)
Weighted <i>N</i>	3 084 040	1 561 867	1 732 226	6 378 133

Note: The data are weighted. Standard errors in parenthesis. Differences from the low formality group are statistically significant at: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.10$.

Source: Authors' calculations from NIDS (2008).

employer-based contribution to a pension compared with about 70% of medium formality workers and 97.2% of high formality workers. Low formality workers tend to fare slightly better in terms of having a written contract (39.3%) or employer contributions to the Unemployment Insurance Fund (37.1%), but they are still less than half as likely to have access to these benefits when compared to medium formality employees (88.1% and 89.8%, respectively). Similarly, medical aid contributions from employers are almost non-existent among low formality wage workers. While only about 25% of all wage workers receive a medical aid contribution from their employer, this is far higher for the high formality workers (72.1%) than for the medium formality group (18.3%).

Health and formality

Figure 1 displays the mean scores for self-reported health and the level of formality for men and women in regular wage employment. The figure shows an improvement in health status as work becomes more formal (a lower number denotes better health: 'excellent'=1). Among male wage workers, average health scores generally decrease, albeit somewhat unevenly and not significantly, as the number of formal work attributes increase. Men with zero formal work attributes report a mean self-reported health score of 2.1, while male workers with all 11 of the formal work attributes report an average health score of 1.4.

Mean health scores are generally higher (indicating poorer health) among female wage workers and the association between formality and self-reported

health is also more linear and is statistically significant. Women working in regular wage work with no formal attributes report a mean self-reported health score of 2.6, while women with 10 formal work attributes have a score of 1.8. Findings indicate that among both men and women there is a correlation between higher levels of formality and reporting better health status.

Table 7 compares the distribution of the self-rated health responses among the different categories of wage workers. There are no significant differences in reporting excellent health between low and medium formality employees, but those in high formality employment are significantly ($P < 0.10$) more likely to report excellent health (42.7% of high formality versus 35.1% of low wage workers). Similarly, low formality workers are significantly ($P < 0.05$) more likely to report poor health than those in high formality work.

The correlates of poor health

This section builds on the descriptive statistics from the previous section and explores whether risks are still higher for informal wage workers after controlling for variables such as earnings, education, and selected demographic characteristics likely to be associated with health.

Table 8 presents the results from a series of ordered probit regressions with self-reported health as the dependent variable. In the first column (I), a negative coefficient suggests a significant protective effect of formal job attributes on health status. In other words, each additional formal attribute predicts a

Table 6 Benefits received by South African wage workers by level of job formality (%)

	Low	Medium	High	Total
Pension	8.89% (1.70)	69.55%*** (2.31)	97.24%*** (0.79)	47.74% (1.27)
Receive end of year bonus	9.96% (1.12)	41.80%*** (2.58)	74.21%*** (2.25)	35.21% (1.22)
Written contract	39.28% (1.69)	88.06%*** (1.57)	93.17%*** (1.26)	65.86% (1.19)
Unemployment Insurance Fund	37.10% (1.73)	89.76%*** (1.50)	89.62%*** (1.29)	64.26% (1.18)
Medical aid	1.64% (0.56)	18.32%*** (1.99)	72.14%*** (2.32)	24.87% (1.10)

Note: The data are weighted. Standard errors in parenthesis. Differences from the low formality group are statistically significant at: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.10$.

Source: Authors' calculations from NIDS (2008).

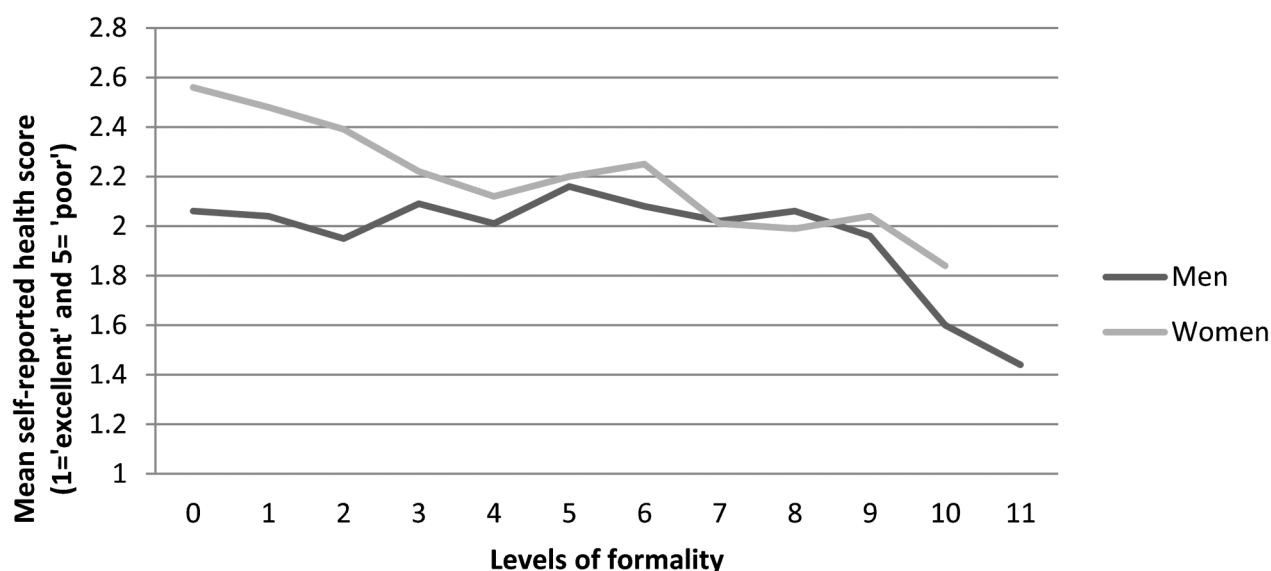


Figure 1 Mean scores for self-reported poor health by level of formality and gender. Source: Authors' calculations from NIDS (2008). Notes: The data are weighted. Self-reported health is measured on a five-point scale where 1 is described as 'excellent' and 5 is 'poor'. Mean health scores are significantly better ($P < 0.10$) for women with at least seven formal work attributes. Health scores do not change significantly for men.

lower score on the self-reported health scale, indicating better health. The second regression model controls for the effects of gender, age, race, and living in an urban area on the relationship between self-reported health and formal job attributes. As in a number of other contexts, the coefficient for gender (0.153) indicates that women report significantly poorer levels of self-reported health compared with men.³⁰ The results also suggest that, after controlling for these other factors, black South Africans report worse health than white South Africans. However, even after holding all these factors constant the negative association between self-reported health and formal job attributes (-0.042) remains significant ($P < 0.001$).

In the third column of Table 8 (III), the model controls for years of schooling. As expected, wage workers with more education are significantly less likely to report poor health. In this regression, the only significant correlates of health are education, age, and gender. After controlling for years of education, women are still significantly more likely to report poor health than men. Given the additional protective effect that income is likely to have on health, the fourth regression (IV) controls for income and suggests that income and education are both negatively and significantly associated with poor health.⁴ Once the estimations control for education and income, age and gender are the only significant correlates of self-reported health status.

While these results indicate that the protective effect of formality in employment is not significant after controlling for education and income, estimations I–IV do not take into account the effects that formal job attributes may have for different sub-groups. Given

the significant risk of poor health associated with age and gender, the final estimation in the table (V), includes two interaction terms. In the first interaction, gender is combined with formal job attributes and the significant negative coefficient (-0.057) suggests that employment formality for female wage workers is a significantly greater protector of health than it is for men in wage employment. In other words, women are significantly less likely than men to report poor health with each additional formal job attribute (controlling for all other factors). There is also a small, but positively significant association (the coefficient for this interaction term is 0.002) among older wage workers and formality in employment.

Variables measuring the average district income and mean district health scores were also included in the model (not shown in the table) to test whether the results in the final estimation are robust to possible effects from relative health and income.³² Results suggest that the levels of both health and income in a worker's local municipal district are significantly associated with self-reported health status, but that the coefficients on the other variables do not change appreciably (P value). The finding that formal work attributes have a significantly greater protective effect on women's health (holding income, education, and all other factors constant) is therefore robust to some of the effects of relative deprivation and health on subjective health reporting.

Discussion

Using a unique source of data, this study provides evidence that employment formality is significantly associated with health in South Africa. However, in a context where earnings are significantly lower for

Table 7 Self-reported health status of South African wage workers by level of employment formality

	Low	Medium	High	Total
Self-reported health				
Poor	4.53% (0.74)	2.69% (0.86)	1.38%** (0.43)	3.23% (0.43)
Fair	7.54% (0.82)	9.61% (1.51)	7.76% (1.23)	8.10% (0.64)
Good	24.83% (1.45)	22.62% (2.06)	23.34% (2.03)	23.89% (1.02)
Very good	28.01% (1.62)	30.77% (2.62)	24.75% (2.22)	27.81% (1.18)
Excellent	35.09% (1.71)	34.31% (2.42)	42.77%* (2.51)	36.98% (1.23)
Total	100.00%	100.00%	100.00%	100.00%

Note: The data are weighted. Standard errors in parentheses. Differences from the low formality group are statistically significant at: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.10$.

Source: Authors' calculations from NIDS (2008).

informal workers, the results do not suggest that the level of formality in wage employment is a health risk over and above the association between low earnings and poor health. In other words, we found that low earnings are one of the strongest correlates with poor health and that formality in employment is not significant after controlling for income. These results are not surprising, given the expected difficulty in separating the impact of employment and low living standards on health outcomes in a developing country context. Although South Africa has relatively good basic services, inequality in provision means that many poor workers are likely to live in poorly serviced areas. It may also be the case, as in Brazil, that low levels of compliance to workplace health and safety regulations, even in formal workplaces, blur the distinction between formal and informal workers in terms of the association between work and health. Nevertheless, we find that women in jobs with low formality are significantly more likely to report a worse health status than men in low formality jobs. In other words, the association

between job informality and poor health is significantly greater for women than for men in wage employment in South Africa.

There are a number of possible explanations for this gendered effect of informality on health. A leading cause of work-related deaths and injuries for women is violence in the workplace.³³ Gendered power dynamics in the workplace mean that women are also less likely to complain about health and safety hazards, including any violence that they experience.¹¹ Women also experience more acutely than men the “double-burden” of income earning work and taking care of the home. The stresses involved in this balancing act, and the toll they take on health, are notorious and the subject of a large literature.^{34–37} While women from all social classes experience the double-burden, it is likely that women in forms of employment with few labor protections suffer the most. Long hours at work may extend the time into the evening and night when they must look after the needs of their own household. Not having legal work protections means that they may not be

Table 8 Ordered probits for self-reported poor health among South African regular wage employees

	I	II	III	IV	V
No. of formal job attributes	-0.034*** (0.010)	-0.042*** (0.011)	-0.015 (0.012)	0.001 (0.014)	-0.059 (0.041)
Demographics					
Female		0.153*** (0.054)	0.209*** (0.056)	0.166*** (0.057)	0.423*** (0.109)
Age		0.028* (0.016)	0.027* (0.016)	0.032** (0.016)	0.026 (0.016)
Age squared		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Black		0.161* (0.089)	0.032 (0.092)	-0.080 (0.094)	-0.074 (0.094)
Colored		0.098 (0.102)	-0.052 (0.108)	-0.127 (0.110)	-0.115 (0.110)
Indian		0.087 (0.216)	0.049 (0.214)	-0.011 (0.232)	0.011 (0.236)
Urban		-0.055 (0.058)	0.042 (0.059)	0.073 (0.059)	0.067 (0.059)
Education and income					
Years of school			-0.056*** (0.009)	-0.042*** (0.009)	-0.044*** (0.001)
Log of income				-0.123*** (0.041)	-0.114*** (0.042)
Interactions					
Female*formality					-0.057*** (0.021)
Age*formality					0.002** (0.001)
F stat	11.31	16.56	20.43	16.90	14.70
Prob>F	0.00	0.00	0.00	0.00	0.00
N	25 147	25 113	25 100	24 990	24 990

Note: The data are weighted. Standard errors in parentheses. ***Significant at the 99.9% confidence level. **Significant at the 95% confidence level. *Significant at the 90% confidence level. Dependent variable is self-reported health status (1=excellent, 5=very poor). The omitted categories are: male, white, and rural. Results are robust to estimations controlling for both average district earnings and average district self-reported health scores.

Source: Own calculations from NIDS 2008.

allowed to take leave when a child is sick, which is likely to be an additional source of stress. The lack of labor protections can mean that they are not able to care for themselves adequately either; for example, by taking time off work to visit the doctor when they are ill.

A fourth reason, and one which suggests pathways for further research in the South African context, is that women with high formality jobs are less likely to be employed in private households. In South Africa, almost a third of female wage workers with a low number of formal job attributes are employed in a private household. Considering that domestic work is a significant source of female employment in South Africa, it is likely that many of these women are employed as domestic workers.²³ As prior research has shown, domestic workers often face challenging working conditions, with higher rates of injury and mental stress than women employed in non-domestic occupations.^{13,15} While domestic work is formally regulated in South Africa, monitoring and enforcement of policies is difficult and it is possible that this form of employment takes a considerable toll on the health of women in South Africa.

A limitation of this study is its cross-sectional design, which does not allow for the determination of the direction of causality; whether it is low formality that causes poor health, or poor health that causes women to take up less secure forms of employment. Moreover, unlike Lund and Ardington, this study does not suggest that formality in employment is correlated with health independently of income (cite). The reasons for this difference are likely to be related to the reference category used and differences in sampling. Lund and Ardington used the self-employed as a reference group, whereas this study focused on wage workers exclusively. Using a nationally representative data set, the sample size in this study was much larger than that used by Lund and Ardington, whose sample was not only smaller, but limited to a rural area where levels of income were likely to be more homogenous than in South Africa as a whole. It is plausible that this greater homogeneity meant that formality was a stronger discriminator of health status than income.

This link between domestic work and poor health that this study suggests is an important area for further research, and one which will be of importance to the International Domestic Worker's Network in their campaign for the ratification of the ILO Convention on Decent Work for Domestic Workers (C189) (South Africa is one of the 12 focal countries in this campaign). Future research should explore the types of formal attributes that are most important in relation to self-reported health status. It may also be possible to determine the direction of causality

between formality and health status by exploiting all three waves of the NIDS, although this would depend on whether or not a substantial number of people had changed their status in employment.

Disclaimer Statements

Contributors Laura Alfers and Michael Rogan are both authors on this paper and should be cited as such.

Funding None.

Conflicts of interest Both authors are affiliated to Women in Informal Employment: Globalizing and Organizing, a research and advocacy network which aims at improving the status of the working poor in the informal economy.

Ethics approval This research was not clinical and did not require ethical approval.

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