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Picking waste for a “dollar or a dime”: An income analysis of street waste pickers in South Africa’s informal economy¹

Kotie Viljoen², Derick Blaauw³ & Rinie Schenck⁴

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Corresponding author:

Derick Blaauw

School of Economics

North-West University, Potchefstroom Campus

Tel +27 18 285 2488

Derick.blaauw@nwu.ac.za

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Abstract:

High levels of unemployment in South Africa forces many unskilled people into the informal economy, where they have to resort to a variety of income-generating activities. The activity of collecting and selling recyclables presents virtually no barriers to entry, making it a viable option for many people with low levels of schooling and other forms of human capital. Many street waste pickers in South Africa therefore make a living collecting other people’s waste. Like many other participants in the informal economy, street waste pickers vulnerable to high levels of insecurity and low incomes (Bonner, 2008:7; Heintz & Jardine, 1998:32). As a result street waste pickers may be trapped in the lower tier of the informal economy and in a state of poverty and deprivation (Viljoen, 2014).

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² Senior Lecturer, Department of Economics & Econometrics, University of Johannesburg, South Africa

³ Professor, School of Economics, North-West University, Potchefstroom Campus, South Africa

⁴ Professor, Department of Social Work, University of the Western Cape, South Africa

The aim of this paper is to assess the street waste pickers' income and to determine the factors that influence their income. Little research focusing on street waste pickers has done, and when done it mostly takes the form of case studies focusing on the socio-economic position of waste pickers on dump sites. This paper uses the results of the first ever country wide study among street waste pickers in South Africa, using a mixed method research model. Structured interviews were conducted between April 2011 and June 2012 with 914 street waste pickers and 69 buy-back centres in 13 major cities across all nine provinces in South Africa. The income of the 914 street waste pickers is analysed. A statistical, cross-sectional and logistic regression analysis is applied to test whether variables identified in the literature have an influence on their income, the significance thereof and the extent to which it explain some of the income variation.

Key words: informal economy, street waste pickers, recycling

Introduction

For some people waste is worthless but it provides a livelihood for many street waste pickers in South Africa. Manufacturing industries demand recyclable waste to use as an input in their production process which gives value to the waste. The demand for recyclable waste therefore has value for those who collect and sell it (Ullah, 2008:2) and provides them with an income earning opportunity.

The question that arises is whether this income earning opportunity generates a sustainable and decent income for the waste pickers. Previous studies indicate that the income earned by most waste pickers in the informal economy are low and that their socio-economics conditions are poor (Annepu, 2012:1; Benson and Vanqa-Mgijima, 2010:15; Hayami et al., 2006:49; Masocha, 2006:839; McLean, 2000a:20; Quazi, 2011:2; Schenck, Blaauw & Viljoen, 2012:53; UNESCAP, 2011:20; WIEGO, 2011:1). Many waste pickers face chronic poverty despite their attempts to generate a livelihood in the informal economy picking waste (Masocha, 2006:839). The income earned by waste pickers is also reported to be insufficient to meet their basic needs for shelter and food, and many cannot afford regular meals (Carrasco,

2009:19; Gutberlet & Baeder, 2008:9-10). This makes it difficult for waste pickers to become part of the broader society.

The income is further irregular and uncertain which subject them to economic insecurity (Carrasco, 2009:17; Gutberlet & Baeder, 2008:9; Medina, 2005:19; Schübeler, 1996:23). Most studies do not distinguish between the different kinds of waste pickers. The studies by Medina (2005:19) and Schenck et al., 2012:55) found that the income earned by the waste pickers on the landfill sites is higher than those of the street waste pickers. This makes street waste pickers the lowest income earners in the recycling chain and one of the most vulnerable groups of participants within the informal economy in terms of the high poverty levels amongst them and their low and uncertain incomes (Carrasco, 2009:19; Gutberlet & Baeder, 2008:9-10; Schenck et al., 2012:52).

A literature review of a number of national and international studies disclosed several factors that might have an influence on the income of waste pickers but none of the previous studies attempted to analyse the income of the waste pickers. Most previous studies only report on the size of the waste pickers' income and the determinants of the prices that recycling companies and buy back centres pay for the different types of waste (Langenhoven & Dyssel, 2007:120; Plastic Federation of South Africa, 2010:1; Schenck et al., 2012:56; Viljoen, Schenck, & Blaauw, 2012). The reason for this might be attributed to the small sample sizes used in the studies. There is therefore a gap in the research to analyse the level of significance and the extent to which these factors explain some of the income variation amongst street waste pickers.

The aim of this paper is to assess whether street waste pickers earn a decent income and to identify the factors that might have an influence on their income. A statistical and cross-sectional regression analysis is applied to test the significance and extent to which the variables explain some of the income variation. Income data of 914 street waste pickers in 13 major cities in South Africa is analysed. Knowledge gained from this will assist street waste pickers and policy makers in their decisions on how to improve the income of street waste pickers.

Literature review

A number of factors that influences the income of waste pickers in general were identified in the literature and will be discussed next.

Prices of recyclable waste

The prices of recyclable waste are determined by the supply and demand thereof and have a major influence on the income-earning potential of waste pickers (McLean, 2000a:10; Viljoen et al., 2012:4). Street waste pickers have very little influence over the prices they receive except to properly sort the waste. The price of mixed waste is substantially lower than what they can earn for properly sorted waste (Viljoen et al., 2012:8; Viljoen, 2014:233). In 2012, the national mean income for mixed paper was 26 cents per kilogram, which was slightly higher than the price for magazines and newspapers which paid 24 cents and 22 cents respectively, but much lower than the price paid for white paper and coloured paper which paid R1.03 and 45 cents respectively (Viljoen, 2014:233). The same holds for unsorted or mixed plastic.

The market for some recyclable waste is highly cyclical and any decrease in the price reduces the income earning potential of waste pickers (Langenhoven & Dyssel, 2007:125; McLean, 2000b:6; Tangri, 2010:6).

Exchange rate fluctuations also influence the prices of the recyclable waste products that are exported, like paper, plastic, and metals (Muller & Scheinberg, 2003:16). Another factor that influences the earnings of waste pickers is the weather. Waste pickers usually pick less waste during the rainy season (Agunwamba, 2003:118). The buy-back centres also pay lower prices for wet or damp waste than for dry waste as the damp waste weigh more (Langenhoven & Dyssel, 2007:117; Sentime, 2011:104). The heavier weight of damp waste might compensate for the lower price, but restricts the quantity of waste that a street waste picker can carry over long distances (Viljoen, 2014:39).

Quantity of recyclable waste collected

The income of waste pickers also depends on the quantity of recyclable waste available to them which in turn depends on the quantity of waste generated in the

area in which the street waste pickers collect waste. More waste is generated in areas where the incomes of those who generate the waste are high (Medina, 2007:55). Therefore, the wealthier the waste generators are, the higher the income-earning possibilities for waste pickers might be.

Characteristics of street waste pickers

Sentime's (2011:104) 2011 study in Braamfontein reported that male waste pickers earn higher incomes than female waste pickers. This was backed by a study in the Free State in 2012 by Schenck et al. (2012:52) who also found that the average earnings of male landfill waste pickers were greater than their female counterparts. The study by McLean (2000a:22) in Durban identified age as a factor that has an influence on a waste picker's income-earning potential, with younger waste pickers earning higher incomes than older waste pickers.

Source of recyclable waste

The source where the waste is collected also influences a waste picker's income. A study in the Free State in 2012 amongst 52 street waste pickers and 410 landfill waste pickers found that the incomes earned by street waste pickers are less than that of landfill waste pickers (Schenck et al., 2012:52).

A number of other factors that relate to the waste picker's working conditions were also identified.

Number of hours worked

A survey in Kampot, Cambodia, in 2009 and a study in Dhaka City, Bangladesh, in 2008, found a positive correlation between the income of waste pickers and their daily working hours (Ullah, 2008:12; UNESCAP, 2011:20). According to Benson & Vanqa-Mgijima (2010:21), this correlation is not necessarily positive. Therefore, it is uncertain whether the length of the working day will influence the income.

Competition

Some studies identified competition as a **variable** that might have an influence on the income of waste pickers (Benson & Vanqa-Mgijima, 2010:10; Schenck & Blaauw,

2011:428; Schenck et al., 2012:76). There seems to be a negative relationship between the levels of competition and the income-earning potential of waste pickers.

Starting time

The starting time of waste collection might also influence the street waste pickers' income as the potential recyclable waste available is scarce and available to the waste picker who finds it first (Benson & Vanqa-Mgijima, 2010:17; McLean, 2000a:19; Sentime, 2011:104). According to a study in 2010 amongst cardboard collectors in Durban, the lack of supply of cardboard negatively affected the cardboard collector's income.

Equipment used

A study by McLean's (2000a:15-16) in Durban in 1998 found that waste pickers who uses a trolley to carry the recyclables collected, earned more than those who used other equipment such as bags or those who carried the waste on their heads.

Foreigners

Although no mention is made that foreign waste pickers earn higher incomes than South African born waste pickers, a national study in South Africa in 2007 found that foreign day labourers in the informal economy earn more than the South African born day labourers (Blaauw, 2010:155). The foreigner status of street waste pickers is therefore identified as a factor that might have an influence on street waste pickers' incomes.

Education and job experience

According to the human capital investment theory, there is a positive relationship between the level of education and the income earned (McConnell & Brue, 1995:82-84). Job experience and earnings are also expected to have a positive correlation (Shack-Marquez, 1984:15). Being a waste picker requires no education or skills and the waste picker has a guaranteed buyer for the waste picked. The question is whether higher levels of education and previous job experience will increase their chances to earn higher incomes than the street waste pickers with lower or no education and job experience.

The variables identified in the literature that might have an influence on the income of street waste pickers were gathered from many different studies with small population sizes. Most of these studies also do not distinguish between street waste pickers and landfill waste pickers and just refers to waste pickers in general.

Methodology / Research approach

In order to determine whether these factors identified in the literature has an influence on the income of street waste pickers and whether those differences are statistically significant or not a cross sectional regression analysis is applied.

The study uses the income data from a database consisting of qualitative and quantitative data of 914 street waste pickers and 64 buy back centres across 13 major cities in South Africa. The data was collected between 19 April 2011 and 28 June 2012 using a non-probability sampling technique namely snowball sampling. The reason for using this sampling technique is because there is no sampling frame available for the research population. Snowball sampling is a respondent assisted sampling method (Castillo, 2009:1; Daniel, 2012:111). Given the nature of the factors identified in the literature, and the fact that some of the data are available in categorical or ranked form, non-parametric techniques were firstly used to analyse whether there is differences between the independent variable and income and whether the differences are statistically significant or not (Pallant, 2010:213).

In cases where the data on the independent variables has two groups or categories the Mann-Whitney U test was used to test for differences and the level of statistically significance thereof. For data with more than two groups or categories, the Kruskal-Wallis test was used. To assess the correlation between income and a continuous independent variable, the Spearman correlation test was used.

From the statistical analysis, the variables that result in statistically significant differences in the income of street waste pickers, was identified. The statistical analysis was followed by a cross-sectional regression analysis to assess whether and to what extent these identified variables explain the variation in the street waste pickers' income.

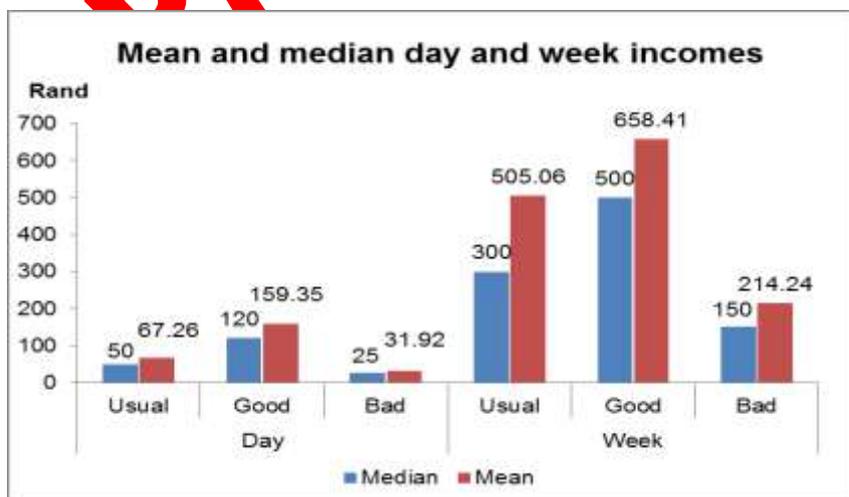
Analysis of the street waste pickers' income and interpretation of the findings

Street waste pickers can be divided into two groups based on their income. The first and largest group is those who earn their income on the day on which they have collected the waste. The second group is those who store their waste and sell it weekly. Of the total of 873 street waste pickers who revealed their income, 751 earn their income for a day's waste collected, while 122 reported it for a week's waste collected. Due to the uncertainty and variation in the incomes earned by street waste pickers, the income data collected in the survey covered 3 different scenarios namely the income usually earned on a day or week, the income earned on a good day or week and the income earned on a bad day or week. The analysis of the results will be based on the usual day and week income unless stated otherwise.

Overview of the income of street waste pickers

The income earned by street waste pickers for a usual, good and bad day and for a usual, good and bad week is illustrated in Figure 1. The average usual income earned for a day's waste is R67.29 with a median income of R50. The mean income earned for a usual week's waste is R508.79 and the median income is R300. The relatively large difference between the mean and median incomes is due to outliers. The median income is therefore a better indication of the incomes earned and shows that half of the street waste pickers usually only earn R50 or less for a day's waste and R300 for a week's waste.

Figure 1: The mean and median incomes for a usual, good and bad day or week (2012)



Source: Survey data

The average number of dependents who rely on a street waste picker's income is four (including the street waste picker) (Viljoen, 2014:242). According to the upper-bound poverty line, the per capita income needed to lift a person out of poverty is R636 per month in 2012 prices (StatsSA, 2014). For a family of four, this will amount to R2544 per month. Based on the median income of street waste pickers of R50 per day or R300 per week, half or even more of the street waste pickers fall far below that poverty line. Many street waste pickers also cannot afford to buy enough food as stipulated by the Food Poverty Line (FPL). The FPL amounted to R321 per capita per month in 2011 prices and around R329 in 2012 prices. For a family of four, R1316 is needed. Given that street waste pickers do not receive R50 for each day or R300 for each week of the month, it is clear that most of the street waste pickers' income is not enough to sustain their daily intake. The income of street waste pickers is therefore not enough to lift them out of poverty.

The large differences between the incomes earned on a good, usual and bad day or week confirms the claim that the street waste pickers' income is uncertain. This uncertainty is caused by price fluctuations, differences in the prices of the different recyclable waste products and the uncertainty of the type and quantity of waste products the street waste pickers will be able to collect on any given day. Because of this uncertainty, street waste pickers cannot predict or estimate what their income will be, making it difficult for them to plan ahead. The uncertainty is also reinforced by the price differences between BBCs in the same areas.

Prices of waste products

The differences in the prices of recyclable waste products make certain products more valuable. The higher the volume of the more valuable recyclables collected by a street waste picker, the higher the income will be.

Table 1 shows the minimum, maximum, mean and median prices per kilogram of the different types of recyclable waste products on a national level. The price information is based on data collected from sixty nine buy-back centres across the thirteen cities covered in the national study.

Table 1: Mean, minimum, maximum, and median prices and standard deviation of the different recyclable waste products (per kg), 2012 (n=69)

Type	f	%	Mean	Standard deviation	Minimum (Rand)	Maximum (Rand)	Median (Rand)
White paper	55	79.7	1.03	0.545	0.20	2.30	1.00
Coloured Paper	39	56.5	0.45	0.327	0.10	1.50	0.35
Magazines and books	47	68.1	0.24	0.132	0.05	0.80	0.20
Newspapers	49	71.0	0.22	0.115	0.05	0.60	0.20
Mix paper	46	66.7	0.26	0.199	0.05	1.00	0.20
Cardboard	48	69.6	0.37	0.146	0.15	0.70	0.30
PET	33	47.8	1.22	0.692	0.15	3.20	1.00
HDPE	28	40.6	0.72	0.317	0.15	1.60	0.70
PVC	14	20.3	1.01	1.232	0.10	5.00	0.70
LDPE	28	40.6	0.99	0.507	0.15	2.00	0.95
PP	17	24.6	0.95	0.485	0.15	1.80	1.00
PS	2	2.9	0.38	0.318	0.15	0.60	0.38
Plastic mix	21	30.4	0.54	0.255	0.05	0.90	0.50
Cans	38	55.1	0.63	0.350	0.10	1.50	0.50
Glass	31	44.9	0.23	0.085	0.10	0.40	0.20
Tetrapak	4	5.8	0.53	0.320	0.30	1.00	0.40

Source: Survey data

The three most valuable waste products (excluding metals) in terms of the national mean price per kilogram are PET (R1.22), followed by white paper (R1.03) and PVC (R1.01). The three least valuable recyclable waste products in terms of the national mean price per kilogram are newspapers (R0.22), glass (R0.23) and magazines (R0.24). Plastic and paper is therefore the most valuable non-metal recyclable waste product for street waste pickers to collect.

One would expect street waste pickers to be selective in the type of waste they collect to get the highest possible income per kilogram of waste collected. The data show that only 72 or 7.9 per cent of the street waste pickers collected one specific recyclable waste product. These street waste pickers mostly collected paper followed by plastic products, metals and cardboard. Very few collect only glass or only cans. The mean income for the street waste pickers who only collected plastic was the highest at R86.50 day and R686.43 week income, followed by a mean day and mean week income of R66.60 and R686.43 respectively for cardboard and a

mean day income of R43.00 and mean week income of only R140 for paper. The mean income for those who only collect glass or cans amounted to R20 and R11 respectively.

Low level of specialisation in only one product might be ascribed to the scarcity of the higher valued recyclable waste products (Viljoen, 2014:236). The street waste pickers might however be selective in the combination of recyclable products they collect. Street waste pickers who collect a combination of plastic, cardboard, and cans earned the second highest mean day income of R68.25. Street waste pickers collecting almost all types of waste products including plastic, paper, glass, metal, and cans earn the second highest mean week income of R604.10.

The combinations or types of recyclable products as well as the weight of each type of waste product collected by an individual street waste picker differ from day to day. This attributes to the uncertainty and unpredictability of their income. Because of a lack of data on the exact combination and weight of each recyclable waste product collected by each individual street waste picker, the price variable cannot be included in a regression analysis to test the relationship between the prices and the income.

A micro study to collect this type of data might reveal interesting insight into the income-price relationship. The statistical and cross sectional regression analysis will use the other factors identified in the literature to determine the factors that might influence the income of street waste pickers. These factors are gender, age, use of a trolley, duration or hours worked on a day, educational attainment level, country of origin, the starting time of waste picking activities and being married or living with a partner. These factors impact on the quantity of recyclable waste products that street waste pickers collect which in turn, influence their income.

Table 2 summarises the results of the Mann-Whitney, Kruskal-Wallis and Spearman Correlation tests and the statistical significance (p-values) of these tests for each factor that are expected to have an influence on the income of the street waste pickers.

Table 2: Summary results of the Mann-Whitney, Kruskal-Wallis and Spearman Correlation tests

Summary of Mann-Whitney test results, 2012		
Variable	Day (p)	Week (p)
Gender (Male/Female)	***.009	***.0005
Foreign vs South African	0.059	***.0005
Part of a group	0.514	**0.009
Using a trolley	***.0005	**0.001
Previous job experience	0.818	0.873
Other training	0.181	0.848
Summary of the Kruskal-Wallis tests results, 2012		
Educational attainment levels	0.269	0.486
Marital status (categories)	*0.020	0.17
Summary of the Spearman Correlation tests results, 2012		
Number of hours worked a day	***0.0005	.113
Age	***.0005	***.0005
Starting time of waste picking activities	**0.011	***.0005

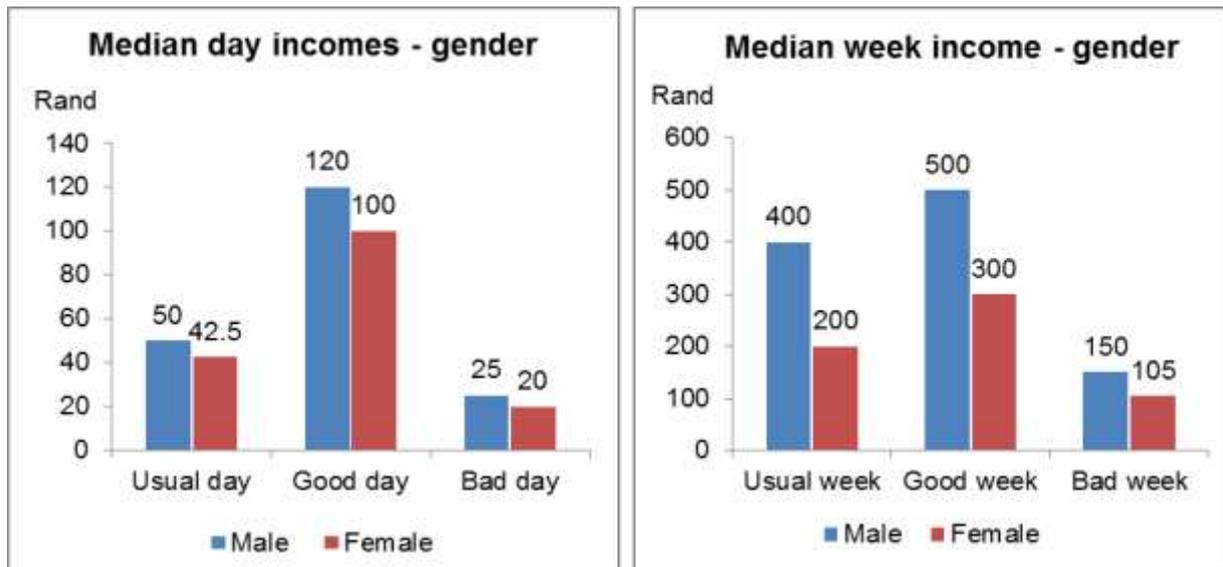
*, **, *** 10%, 5%, 1% level of significance, respectively
 Source: Survey data

Gender

The Mann-Whitney U test reveals statistically significant differences between the usual day income of females and males at a one per cent level, but the size of the difference (r) is small. The difference between the usual week income of males and females is also statistically significant at a one per cent confidence level and the size of the difference is medium.

The data as presented in Figure 2 also reveals that male street waste pickers tend to earn a higher income than female street waste pickers.

Figure 2: Comparison between the median income for a usual, good, and bad day and week and gender, 2012



Source: Survey data

The median usual day income of female street waste pickers is R42.50 which is around eighty per cent of that of the male street waste pickers' R50. The median usual week income of females is only R200 or half of that of the males. The reasons why females earn lower incomes might be related to their family responsibilities preventing them to start early in the morning or to work long hours. Females might also collect less waste due to the lack of physical ability and strength to carry heavy loads over long distances.

Age

To test the correlation between the usual day and week income and age, the age of the street waste pickers was used as an independent continuous variable. The result of the Spearman correlation test shows a negative, statistically significant correlation between age and both the usual day and usual week income, at a one per cent confidence level. It therefore seems that the income potential is higher for younger street waste pickers than for older street waste pickers.

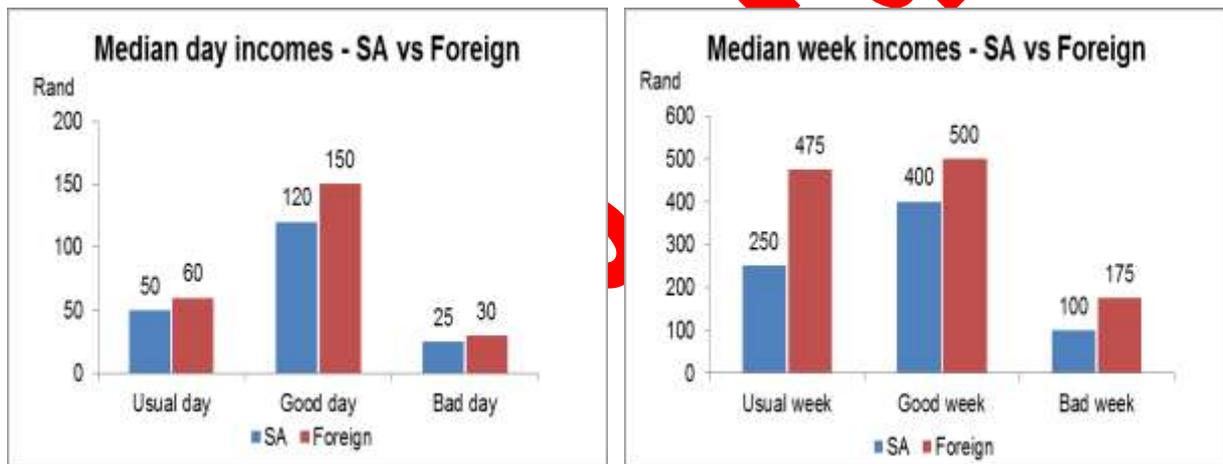
A comparison between the median usual day and week incomes and age indicated that the age groups between 15 and 44 is higher than for the older street waste pickers and above the national median usual day income. The street waste pickers in the 25-34 years age category earned the highest median usual day income of R70. The two younger age groups, 15-24 years and 25-34 years, also recorded the

highest median week income of R400. The reasons for younger street waste pickers' income might be ascribed to the fact that younger street waste pickers are physically more able to move quicker and to collect and manage higher and heavier volumes of waste.

Foreign vs South African

From the income data as depicted in Figure 3, it appears that Foreign born street waste pickers earn both higher usual day and week incomes than the South African born street waste pickers.

Figure 3: Comparison between median day incomes for South African-born versus foreign-born street waste pickers, 2012



Source: Survey data

The results from the Mann-Whitney test however reveal that the differences for the usual day income are not statistically significant but for the usual week income the difference is statistically significant at a 1% confidence level. It might be that the foreign street waste pickers tend to live and work together and might have storage space which enables them to sell larger volumes. The mean week incomes of street waste pickers who work in a group are compared to those who do not work in a group in Table 3.

Table 3: Mean week income of street waste pickers who work in a group, 2012

Country of origin	Mean week income	
	Work in a group	Do not work in a group
South Africa	243.85	335.91
Zimbabwe	700.00	508.13
Mozambique	150.00	300.00
Lesotho	844.95	378.33

Source: Survey data

The mean usual week income of the street waste pickers from Lesotho and Zimbabwe is much higher at R844.95 and R700.00 per week respectively compared to the R243.85 of the South African street waste pickers who work in a group. The mean incomes of South African born street waste pickers are far less than the national mean usual week income of R505.06. The Mann-Whitney test also shows statistically significant differences at a 1% confidence level between the usual week income for street waste pickers who work in a group and those not working in a group. There is no statistically significant difference for the usual day incomes.

Type of equipment used

The income results as shown in Table 4 indicate that street waste pickers who use a trolley are better off than those who use bags, wheelbarrows and their heads to carry the waste. The median usual day income is almost 50 per cent higher whereas the median usual week income is double for street waste pickers with trolleys.

Table 4: Differences between the usual day and usual week income and the use of a trolley, 2012

Trolley	Usual day income			Usual week income		
	<i>f</i>	Median	Mean	<i>f</i>	Median	Mean
Yes	504	60	72.32	94	400	577.41
No	238	40	55.84	28	200	278.39

Source: Survey data

The Mann-Whitney test results confirm the income differences at a statistically significant confidence level of 1%. A trolley therefore makes it easier to carry higher volumes of waste over longer distances.

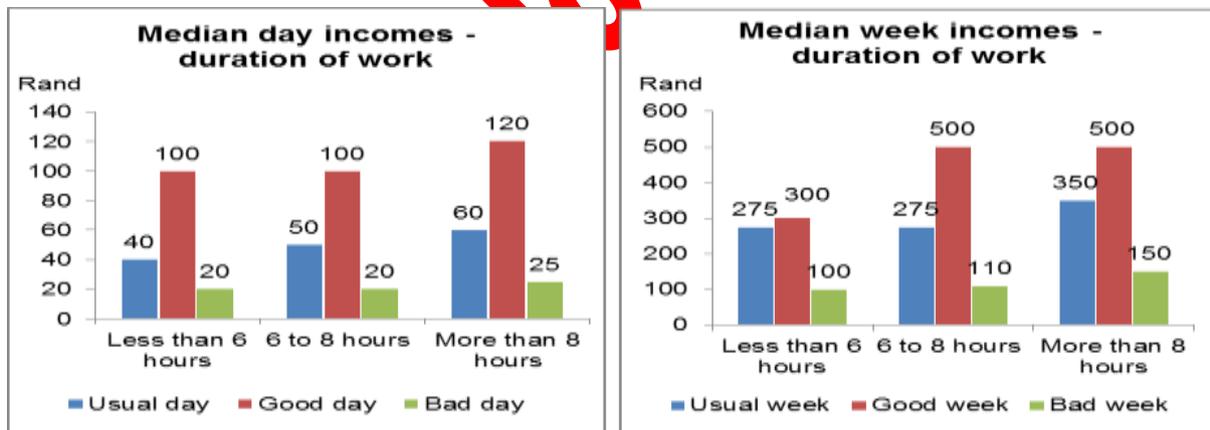
Education, previous job experience and other training

The income data and test results show no statistically significant difference between the usual day and week incomes of street waste pickers and the level of education, previous job experience and other training. It indicates that street waste picking activities require no skills, education or previous experience making it an income earning opportunity for the most vulnerable groups of people.

Length of the working day

According to the income data the median usual day income for the three time intervals as shown in Figure 4, increases with the length of the working day. The median usual week income however, is the same for those who work for 8 hours or less and is only higher for the street waste pickers whose working day is longer than eight hours.

Figure 4: Comparison between the median usual, good and bad day and week incomes and the number of hours worked, 2012



Source: Survey data

The Spearman correlation test was used to test the correlation between the length of the working day as an independent continuous variable and the usual day and week income. The results show a statistically significant positive correlation at a 1% confidence level, between the incomes for a usual day income and the length of the working day but no statistically significant correlation for the usual week income and the duration. The effect is small and might prove the statement by Benson and

Vanqa-Mgijima, (2010:21) that long working hours do not necessarily translate into high incomes.

The recyclable waste products are not freely available and it takes time for the waste pickers to search for recyclable waste in dustbins. Competition amongst the street waste pickers might also limit the waste availability.

Starting time

The results of the Spearman correlation test prove that there is a statistically significant negative correlation at a one per cent confidence level between the income for a usual day and the starting time of the waste picking activities. There is also a statistically significant negative correlation at a one per cent confidence level between the income earned for a usual week and the starting time of the waste picking activities. The reason for this might be that the earlier the street waste pickers start, the better their access to waste which is only available before the municipal trucks empty the dustbins. The early starters might also find the more valuable waste first.

Marital status

Differences between the incomes earned by street waste pickers and the marital status of the street waste pickers revealed differences across the different marital status categories. The widowed, single and divorced street waste pickers earned the lowest median income. Those living with partner or who are married earned the highest median incomes. These differences are statistically significant at a 5% confidence level for the usual day income but not statistically significant for the usual week income. Street waste pickers living with a partner or who are married might be able to work harder because the family responsibilities are shared between them.

In order to test whether and to what extent the variables identified explain some of the income variation, a cross-sectional regression analysis was performed for the usual day income data as the majority of street waste pickers earn day incomes. The results of the cross sectional regression analysis for the usual week income showed that no independent variables caused statistically significant differences.

Cross-sectional regression analysis

The variables that showed statistically significant differences in the statistical tests were used to specify the model.

Usual day income = f (Male, Age, Trolley, Duration, Education, Foreign, MarLwp, Start time)

The usual day income was transformed to a natural log function to provide for outliers that can violate the assumption of normality which is common in large samples (Pallant, 2007:62). Table 5 presents the variables used in the analysis and the expected signs of the coefficients.

Table 5: Variables used in the regression model and the expected signs of the coefficients

Variable	Dummy variable	Continues variable	Expected sign of the coefficient
Gender	MALE		Positive
Age		AGE	Negative
Equipment used	TROLLEY		Positive
Length of the working day		DURATION	Positive
Education level		EDUCATION	Positive
Country of origin	FOREIGN		Positive
Married/living with partner	MARLWP		Positive
Starting time		STARTTIME	Negative

Source: Survey data

The coefficients of all variables are expected to show a positive sign except the age and starting time variables.

Empirical results

The results of the linear regression model is summarised in Table 6.

Table 6: Summary results of the linear regression model

	B	Std. Error	t	Prob
Constant	3.741	.282	13.285	.000
Gender	0.273	.113	2.416	.016
Age	-0.014	.002	-5.732	.000
Trolley	0.3	.062	4.835	.000
Duration	0.031	.013	2.419	.016
Education	0.007	.009	0.725	.469
Foreign	0.131	.120	1.089	.277
Starting time	-0.015	.022	-.647	.518
Married / living with partner	0.074	.060	1.237	.217
Model summary				
R	0.355			
R squared	0.126			
Adjusted R-squared	0.116			
F	11.951			
Obs	671			
df	8			
Prob	0.0005			
Durbin Watson	1.866			

Source: Stata output

The value of the coefficient of determination (R squared) of 0.126 indicates that 12.6 per cent of the income variance is explained by the independent variables included in the model. The variables that are statistically significant are the MALE variable with a positive sign, AGE with a negative coefficient and the TROLLEY variable with a positive coefficient, all as expected. This strengthens the literature that female street waste pickers earn less than male street waste pickers and younger street waste pickers have higher income-earning potential. This might all be ascribed to the physical nature of the work, which becomes more difficult to manage for females and as a waste picker ages. Street waste pickers who use a trolley to carry their waste also earn a higher income than those using other means.

The DURATION variable which represents the number of hours spent picking waste also has a positive coefficient, as expected. It shows that the income earned increases with the number of hours worked.

The variables that are not statistically significant are EDUCATION, FOREIGN STARTTIME and MARLWP all whose coefficients are as expected.

In this model, the TROLLEY variable contributes most to the variation in the income of street waste pickers. The MALE variable has the second highest coefficient.

Conclusions

The income of more than half of the street waste pickers is lower than the upper and lower bound poverty lines. The informal street waste picking activities in its current form is therefore only a survival mechanism for most of the street waste pickers. The informal street waste picking activities further yields higher income earning opportunities for males and for younger street waste pickers than for females and older street waste pickers. The cross sectional analysis reveals that the only variables that can be controlled for by the street waste pickers themselves are to use a trolley to collect waste and to work long hours. These variables however, have a small positive influence on the income. There is therefore not much that street waste pickers can do to improve their income-earning potential.

The model only explains around 12 per cent of the variance in income. It therefore proves that most of the variance in the usual day income of street waste pickers is explained by the prices of the recyclable waste collected and the volume and mix collected. Therefore, street waste pickers rely heavily on the value and mix of the recyclable waste that they collect and the prices paid for the recyclable waste products by the buy-back centres.

Although the informal waste picking activities provide street waste pickers with an income-earning opportunity, for many, it provides little scope for improving their income and consequently their socio-economic conditions.

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