Lifestyle and Income-related Inequality in Health in South Africa

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Introduction

- Epidemiological transition from communicable to NCDs in low- and middle-income countries (Bloom et al., 2012).
- NCDs account for 63% of all mortality (smoking and alcohol use major contributors) - (WHO, 2014).
- Prevalence rate of NCDs varies with socioeconomic status, higher among the poor.
- The gradient of the inequality depends on differences in adopted lifestyles (smoking & alcohol use).
- Income-related inequality in health will widen if such practices are concentrated among the poor.

Introduction

- Premature mortality from NCDs will be five times higher than from communicable diseases by 2030 (Mathers et al., 2008).
- Tobacco and alcohol use are the leading avoidable risk factor for NCDs (WHO, 2013).
- Smoking account for 6 million premature deaths each year (Jha and Peto 2014) and alcohol the third leading in premature mortality (WHO, 2014).
- Prevention of NCDs is considerable more effective and less costly than their treatment (Cecchini et al., 2010).

The South African Context

- South Africa is consistently one of the most unequal societies in the world (Gini coefficient of about 0.7).
- Health inequality remains high with those at the top end of the socioeconomic scale having better health (Ataguba et al., 2015).
- Over 20% of the population are cigarette smokers and over 45% of drinkers are weekly heavy episodic drinkers (WHO, 2011).
- South Africa equally has one of the hazardous pattern of drinking in the world (WHO, 2011).
- Tackling lifestyle risk factors in South Africa could reduce premature disability and mortality by 20% (Atun, 2014).

Evidence from literature

- Evidence points to the positive contribution of smoking, harmful alcohol use and obesity on income-related inequality in health (Balia and Jones, 2008; Vallejo-Torres and Morris, 2010; Vallejo-Torres et al., 2014)
- Research focuses on the contributions of these factors on income-related inequality in self-reported health and mortality.
- Self-reported health is a subjective measure of health (Jylhä, 2009) rather than an objective measure (Wu et al., 2013).
- This paper contribute to this literature by incorporating objective measures, directly associated with smoking and alcohol use.

Objective

- Explore the effects and contributions smoking and alcohol use on income-related inequality in health.

Empirical Analysis

- We use the Erreygers (2009) corrected concentration index (CCI) written as:

$$CCI = \frac{4\mu}{b-a} * CI$$

- Decomposition of the CCI

- The regression analysis expresses the health function of its determinants

$$h_i = \alpha + \sum \beta_{ki} x_{ki} + \varepsilon_i$$

- The decomposed CCI is the weighted sum of the CI for each health covariate.

$$CCI = 4 * \left[\sum \left(\beta_k x_k \bar{CI}_k \right) + GC_\varepsilon \right]$$

Data and Variables

- The four waves of the South African National Income Dynamic Survey (NIDs)
- Health variables are binary equivalent to one if diagnosed of the disease.
- We construct a health index from the indicators using PCA
- Income is household per capita income by adult equivalent.
- Alcohol is binary and smoking is both binary and continuous.

Health inequality

Table: The distribution of disease burden by income quintile

Disease Type	Wave 1					Wave 4				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Current smoker	16.59	21.53	25.04	23.21	13.63	19.38	25.19	26.69	19.33	9.40
Drinks alcohol	19.47	19.56	23.48	22.19	15.29	20.40	24.75	23.79	19.10	11.96
Tuberculosis	25.86	26.72	26.29	17.10	04.02	27.20	29.33	23.63	14.01	05.82
High blood pressure	17.20	23.66	2.27	20.81	13.06	23.14	25.87	23.42	17.64	09.93
Diabetes	12.19	21.58	26.19	25.04	14.99	17.97	24.96	20.63	21.30	15.14
Stroke	16.03	25.64	28.85	19.23	10.26	26.36	28.64	27.73	12.73	04.55
Heart diseases	15.51	23.06	23.47	22.45	15.51	23.59	25.90	25.90	15.64	08.97
Cancer	09.78	14.13	16.30	20.65	39.13	23.19	25.60	17.87	16.43	16.91
Persistent cough	22.43	25.57	24.11	18.97	08.92	27.42	26.46	23.26	15.75	07.11
Depression	27.22	25.53	22.24	16.75	08.26	26.66	25.71	21.95	17.03	08.65
Self-reported health	22.37	26.64	25.89	19.38	05.72	25.35	28.67	24.36	14.60	09.45

Table: Smoking-related health inequality by disease type and by wave

	Wave 1		Wave 4	
	Intensity	Duration	Intensity	Duration
Variable	CCII	CCIage	CCI	CCIage
Diagnosed of tuberculosis	0.001	0.060***	0.021***	0.022***
Have high blood pressure	0.053***	0.233***	0.025**	0.186***
Diagnosed of diabetes	0.021***	0.057***	0.022***	0.073***
Diagnosed of stroke	0.000	0.016***	0.003	0.032***
Diagnosed of heart diseases	0.028***	0.054***	0.014***	0.039***
Diagnosed of cancer	0.019***	0.022***	0.035***	0.010**
Self-reported poor health	0.024***	0.270***	0.022**	0.193***
Health index	0.019***	0.089***	0.006**	0.050***

Result - Income-related inequality in health

Table: Income-related health inequality by disease type and by wave

	Household per capita income		By Adult equivalent	
	Wave 1	Wave 4	Wave 1	Wave 4
Variables	CCI	CCI	CCI	CCI
Diagnosed of tuberculosis	-0.028***	-0.025***	-0.032***	-0.034***
Have high blood pressure	0.023***	0.023***	0.025***	0.022***
Diagnosed of diabetes	0.024***	0.034***	0.025***	0.033***
Diagnosed of stroke	-0.004**	-0.002	-0.006***	-0.002
Diagnosed of heart diseases	-0.013***	-0.002	-0.011***	-0.000
Diagnosed of cancer	0.013***	0.014***	0.013***	0.013***
Self-reported poor health	-0.074***	-0.018***	-0.079***	-0.025***
Health index	-0.019***	-0.003**	-0.021***	-0.004***

Results - Decomposition

Table: The contribution of Smoking and alcohol to income-related inequalities by disease type and by wave

| | Wave 1 | | | | Wave 4 | | | |
| | Smoking | | Alcohol | | Smoking | | Alcohol | |
	Cont	%	Cont	%	Cont	%	Cont	%
Diagnosed of tuberculosis	0.0009	1.15	0.0035	1.79	0.0001	0.21	0.0067	3.48
Have high blood pressure	-0.0008	-1.12	-0.0030	-1.55	-0.0007	-1.26	0.0060	3.12
Diagnosed of diabetes	-0.0010	-1.40	-0.0043	-2.21	-0.0013	-2.36	0.0043	2.2
Diagnosed of stroke	-0.0002	-0.31	0.0006	0.30	-0.0000	-0.04	0.0002	0.11
Diagnosed of heart diseases	0.0014	1.84	-0.0018	-0.91	0.0005	0.95	0.0012	0.65
Diagnosed of cancer	0.0001	0.09	0.0001	0.03	0.0005	0.99	0.0001	0.08
Self-reported poor health	0.0023	3.11	0.0005	0.23	0.0012	2.19	0.0026	1.37
Health index	0.0132	6.72	0.0160	21.29	0.0039	7.35	0.0533	27.8

Results - Smoking Duration

Table: The contribution of smoking duration on income-related inequalities by wave

	Wave 1			Wave 2		
Variable	Elasticity	Contribution	%	Elasticity	Contribution	%
Self-reported health	0.002	0.014	0.614	0.001	0.009	0.353
Health Index	0.013	0.114	5.126	0.019	0.193	7.659
	Wave 3			Wave 4		
Variable	Elasticity	Contribution	%	Elasticity	Contribution	%
Self-reported health	0.004	0.038	1.720	0.004	0.003	1.779
Health Index	0.035	0.315	14.104	0.037	0.025	14.674

Table: The Combine contribution of Smoking and alcohol to income-related inequalities in health by wave

| | Wave 1 | | | | Wave 2 | | | |
| | Health Index | | SRH | | Health Index | | SRH | |
	Cont	%	Cont	%	Cont	%	Cont	%
Individual only smokes	0.000	1.521	0.000	0.490	0.000	3.125	0.000	0.127
Individual only drinks	0.007	8.564	0.001	1.049	0.011	13.527	0.001	0.775
Individual drinks and smokes	0.018	9.834	0.005	2.802	0.025	13.533	0.001	1.046
	Wave 3				Wave 4			
	Health Index		SRH		Health Index		SRH	
	Cont	%	Cont	%	Cont	%	Cont	%
Individual only smokes	0.001	8.879	0.001	0.835	0.000	1.205	0.000	0.004
Individual only drinks	0.013	9.639	0.000	1.183	0.009	16.786	0.001	0.322
Individual drinks and smokes	0.010	16.962	0.001	2.263	0.025	17.613	0.001	2.569

Conclusion

- Significant smoking-related and income-related inequality in SRH and lifestyle-related ill-health
- Smoking and alcohol use contribute positively to income-related inequality in health.
- The contributions of smoking duration are higher than those of smoking participation.
- The contributions of alcohol use are generally higher than smoking - up to 27.8%
- Any policy that reduces tobacco and harmful alcohol use can improve population health and reduce health inequality.

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