Adverse life events and late-life wellbeing: Risk and resilience in an aging post-Apartheid South African cohort

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Abstract

We use data from the Health and Aging in Africa: a Longitudinal Study of an INDEPTH Community in South Africa (HAALSI) cohort to examine how exposure to stressful life events relates to late-life wellbeing. The HAALSI sample represents a population that lived through a period of intense political turmoil and systematic disadvantage and oppression in the form of apartheid and exposure to violent civil war. Exposure to traumatic events does not follow the clear sociodemographic patterning commonly seen in higher-income contexts—wealth, education, and early-life SES were not protective against experiencing adverse life events. Greater exposure to trauma had substantial effects on later-life health and wellbeing, with strong associations seen between adversity and late-life depression, PTSD, and functional disability. In sum, our findings suggest that the legacy of systematic disadvantage and structural violence experienced by older Black South Africans continues to reverberate in terms of late-life psychosocial and physical well-being.

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INTRODUCTION

Adverse life events are known to be important determinants of mental health and wellbeing, with evidence from high income contexts suggesting associations between life-course trauma and a host of negative outcomes in later life. Research has suggested that childhood adverse experiences including abuse, deprivation and neglect may have neurobiological effects that persist into adulthood. These include manifestations of physical illness including cardiovascular and cardiometabolic disease (Steptoe & Kivimäki, 2013), higher rates of inflammation, worse organ function, and higher rates of depression and anxiety in later life (Tosevski & Milovancevic, 2006). Beyond childhood experiences, exposure to traumatic events in later life is associated with elevated stress responses, PTSD, poor mental health, and other adverse outcomes. Those who have experienced these traumas throughout their life course (i.e., experiencing childhood traumas and having additional experience with trauma in adulthood) may be at higher risk of both physical illness and psychopathology.

In this paper, we examine life-course exposure to adversity, and the psychosocial and health correlates of these exposures, in the population of the Agincourt region of South Africa. The life-course of this population is characterized by two major historical events: structural oppression of black South Africans during the Apartheid era (from 1948 to 1994), and a large wave of refugees moving to the area during the Mozambican civil war (from 1975 to 1992). Under Apartheid, much of the majority black population of South Africa was forcibly moved to specially designated 'homeland' areas in rural parts of the country, or, 'Bantustans', where educational opportunities were limited, health care services were often inadequate, employment opportunities were scarce, and exposure to community violence and abuse were common (United Nations, 1963). This forced migration has had substantial long-term effects on the SEP of households in the Agincourt region (Collinson et al., 2014), and the lack of infrastructural improvements during the Apartheid period has let to continuing deficits in transportation, health, and sanitation facilities (Barrett, 2005). During apartheid, employment opportunities within these 'homeland' regions were limited, and even in the post-apartheid period these homeland regions continue to suffer from slow economic growth, inadequate investment in infrastructure, and low rates of employment (Collinson et al., 2014; Kobayashi et al., 2017).

Since the end of Apartheid, rural areas of South Africa have experienced persistently high rates of violent crime, sexual assault, and theft (Abrahams, Mathews, Martin, Lombard, & Jewkes,

2013; Cohn & Breetzke, 2017; Otieno, Marinda, Bärnighausen, & Tanser, 2015). South Africa's highly skewed economy has resulted in a focus on industrial development and urbanization, largely at the expense of the rural economy (Bryceson, 2002), and despite consistent GDP growth since 1994, income inequality in rural South Africa has deepened (Collinson et al., 2014; Statistics South Africa, 2015). Public mechanisms put in place to address life-course trauma in the Black South African population seem to have done little to ameliorate the psychosocial effects of Apartheid—psychological evidence has found little impact of participation in South Africa's Truth and Reconciliation Commission on individual well-being (Kaminer, Stein, Mbanga, & Zungu-Dirwayi, 2001; Stein et al., 2008).

Though the literature on life-course trauma and later life health is well established in high income contexts, relatively little research has investigated these relationships in lower income contexts, even those with a substantial history of adversity. This represents a major gap in the literature, and there are also reasons to believe that the later-life implications of these life-course exposures to trauma may differ substantially in this context. We know little of the impact of such traumas in rural South Africa and in analyzing we seek to add to the body of research

Research from HIC countries suggests a relationship between differential traumas and onset of disease. In HIC's, a number of factors known to be protective against life-course trauma—education, income/SEP, social supports, and household composition. But given the very different and more widespread nature of adversity experienced in the Agincourt region, it is unclear whether these characteristics would have been similarly protective. In the Agincourt region, systematic oppression stemming from Apartheid, the Mozambican civil war, and the post-Apartheid rise in violence and economic strife may have led to exposures to trauma being more widespread, and less sociodemographically patterned, than would be expected from existing research in HICs. If everyone in the Agincourt sample was touched in some way by structural oppression and/or war violence, we may posit that this shared experience could lead to a supportive environment that may ameliorate some of these negative effects. Or, conversely, the burden of collective trauma could lead to even more deleterious effects on health and wellbeing for those experiencing more life-course trauma.

In this paper, we use recently-collected data from the Health and Aging in Africa: a Longitudinal Study of an INDEPTH Community in South Africa (HAALSI) cohort from Agincourt, South Africa. HAALSI is the first Health and Retirement Study (HRS)-sister study conducted in Africa. The HAALSI sample represents a population that lived through a period of intense political turmoil and systematic disadvantage and oppression in the form of apartheid, and a substantial portion

of the sample migrated to the region after fleeing a violent civil war. We utilize data from a questionnaire on exposure to adverse life-course events to investigate two primary questions concerning this population. First, what is the sociodemographic patterning of adverse events? Are there sociodemographic subgroups that experienced particularly high life-course trauma and adversity, or was the whole population similarly affected by these events? Secondly, how does exposure to adverse life-course events associate with depression, post-traumatic stress disorder, physical health, and cognitive health, and does this differ by the type of adverse events an individual was exposed to?

DATA AND METHODS

Data

The study sampling and recruitment methods are described in detail elsewhere (Gómez-Olivé, in press). In brief, eligible participants were men and women aged 40 or over on July 1, 2014, who had lived in the study area for at least 12 months prior to the 2013 Agincourt HDSS Census. Although most HRS international sister studies enroll adults aged 50 years and older, given the substantially shorter life expectancy in parts of South Africa, inclusion of a sample earlier in middle age was deemed important to understand trajectories of health during aging in this context. A total of 5059 eligible men and women aged 40 years or over consented to participate and were included in the baseline HAALSI sample (85.9% response rate). The analyses in this paper focus on a sub-sample of 2,473 individuals from whom additional in-depth life history and lab data were collected. Individuals were automatically included in the sample if they had participated in a previous (2010) study on HIV and non-communicable diseases, all other participants were randomly sampled within age and sex-specific strata to retain comparability to the full HAALSI sample.

Measures

Our primary measure of exposure to adverse life-course events comes from a module on exposure to stressful/adverse life events taken from English Longitudinal Study of Aging (ELSA) life history questionnaire (wave 3 of ELSA). The measure of adverse life-course events was translated and back-translated to ensure reliability. This module asks about whether the respondent has experienced any of 16 different events during their lifetime. Table 1 shows the 16 measures that comprise this index, as well as the proportion reporting experience with each event in the HAALSI sample.

Table 1: Distribution of exposure to adverse life-course events, HAALSI 2015

Adverse life-course events	HAALSI %
CHILDHOOD ENVIRONMENT	
Long-term parental unemployment (age<16)	15%
Parents often argue (age<16)	25%
Parents often drink/use drugs (age<16)	25%
Physically abused by parents (age<16)	38%
SOCIAL/FAMILY ENVIRONMENT	
Close family addicted to drugs/alcohol	21%
Provided long-term care to disabled friend/relative	21%
Experienced severe financial hardship	83%
ILLNESS/ACCIDENT/DISASTER	
Had a life-threatening illness or accident	51%
Experienced a major natural disaster	48%
Close friend/family injured or killed from serious accident or injury	67%
COMMUNITY VIOLENCE	
Victim of serious physical attack	27%
Victim of sexual assault	2%
Witness violent act causing injury/death not in war	49%
WAR VIOLENCE	
Fired a weapon in combat or been fired upon	5%
Witness serious injury/death in combat	16%
Lost close friend/relative in war	14%
Average # of life-course events	5.01
(se)	(2.44)
N	2,473

We explored a variety of sociodemographic factors in our analyses examining the social patterning of trauma in the HAALSI cohort. These were: age cohort (40-49, 50-59, 60-69, 70-79), sex, country of birth (South Africa or Mozambique), household size, marital status, level of education, household wealth, and father's educational attainment and occupation (as a proxy for early-life SEP).

In addition to examining sociodemographic differences in life-course exposure to adverse events, our analyses explore the association of trauma with psychosocial, physical, and cognitive health. We explore the association between adverse events and depression using the 7-item CES-D scale (Levine, 2013; Radloff, 1977); for our analyses we generate a dichotomous variable where a score of 3 or greater indicates the presence of depressive symptoms. To examine relationships between events and post-traumatic stress disorder, we use the 7-item short screening scale for PTSD battery (Breslau, Peterson, Kessler, & Schultz, 1999). A score of 4 or more is considered indicative of PTSD symptoms. We examine how adverse life-course events associate with physical functioning in later live using the activities of daily living (ADL) scale (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963), with individuals considered as ADL limited if they report difficulty on any of: walking across a room, toileting, bathing, eating, or getting in/out of bed. Cognitive impairment was defined as scoring <1.5 standard deviations below the mean composite time orientation and memory score in the HAALSI cognitive battery, or requiring a proxy interview with "fair" or "poor" proxy-reported memory (Kobayashi et al., 2017, in press).

Methods

In our initial analyses, we examine the sociodemographic patterning of adverse events, seeking to understand whether there are subgroups that have been most affected/disadvantaged by exposure to adverse life-course events in this population. For these analyses, we first conduct simple bi-variate analyses, comparing the mean number of events experienced across sociodemographic categories, and conduct multiple linear regression on the count of adverse events to understand the combined associations.

To understand the associations between life-course trauma and psychosocial, physical, and cognitive well-being, we estimate logistic models regressing i) depressive symptoms, ii) PTSD symptoms, iii) ADL limitations, and iv) cognitive score on the total count of adverse events, including sociodemographic controls. Our primary investigations use a simple index (count) of events experienced as the primary outcome. Though this parameterization has a number of benefits—ease of interpretability, ease of computation, and more direct comparability with other

samples—it is likely that there is substantial heterogeneity in the later-life and life-course effects of exposure to these different events. That is, experiencing a violent attack or rape may associate with worse later-life outcomes than spending time caring for a sick or injured loved one. In additional analyses, we conduct analyses categorizing by different types of events, with events grouped as per the major headings in Table 1: childhood environment, social/family environment, illness/accident/disaster, community violence, and war violence. Given the high prevalence of traumatic events in this sample, we generated binary indicators for whether an individual had experienced two or more of the events in each category. This work seeks to explore how different types of traumas may differentially associate with later-life well-being outcomes.

RESULTS

Sociodemographic pattern of exposure to adversity

As shown in the first three columns of Table 2, we find that exposure to adverse life-course events were quite high across all subgroups of the HAALSI population. In column 4, we report coefficients (and significance estimates) from an OLS regression of sociodemographics on the number of adverse events experienced. We find that the largest effects are from birth cohort, with the cohorts born 1946-1955 and 1956-1965 having substantially higher exposure to traumatic events. These birth cohorts lived the entirety of their childhood and most of their midlife under Apartheid, and would have been in their prime adult years during the Mozambican civil war. Gender differentials are also substantial, with men on average experiencing more traumatic events than women. Those born in Mozambique, a population largely made up of former refugees who relocated to the Agincourt area during the 1975 to 1992 civil war, also reporting a higher rate of exposure to traumatic events. Individuals who have separated or divorced from their spouse also reporting somewhat more adverse life course events.

Though there is some variation by demographic characteristics, exposure to these events is universally high. Though we see patterns by age, gender, and country of origin, we find remarkably little variation in exposure to trauma by wealth, childhood SES (as measured by father's education and occupational class), and schooling. This is in marked contrast to findings from HICs, where life-course adversity exhibits strong sociodemographic patterning. These SES gradients are seemingly absent in this rural South African population, indicating that social advantages may not have played a substantial role in protecting individuals from experiencing adverse events.

Table 2: Sample characteristics and baseline associations with total number of adverse life-course events, HAALSI 2015

	N (%)		Mean # of adverse events	95% CI	Linear assoc. w/adverse events
Cohort					
Born 1936-1945	513	(21%)	4.5	[4.22 - 4.7]	ref
Born 1946-1955	526	(22%)	5.1	[4.93 - 5.26]	0.61***
Born 1956-1965	789	(32%)	5.3	[5.12 - 5.43]	0.87***
Born 1966-1975	618	(25%)	4.8	[4.65 - 4.99]	0.50**
Gender					
Women	1,428	(58%)	4.8	[4.71 - 4.94]	ref
Men	1,045	(43%)	5.1	[4.98 - 5.26]	0.43***
Education category					
No formal education	978	(40%)	5.1	[4.92 - 5.22]	ref
Some primary (1-7 years)	928	(38%)	5.0	[4.85 - 5.13]	0.13
Some secondary (8-11 years)	329	(13%)	4.7	[4.49 - 4.97]	0.0064
Secondary or more (12+ years)	230	(9%)	4.6	[4.31 - 4.84]	-0.073
Literacy					
Not literate	1,089	(45%)	5.1	[4.92 - 5.21]	ref
Literate	1,380	(56%)	4.9	[4.74 - 4.97]	-0.17
Country of origin					
South Africa	1,757	(72%)	4.7	[4.65 - 4.85]	ref
Mozambique	712	(29%)	5.4	[5.26 - 5.61]	0.59***
Marital status					
Never married	154	(6%)	4.8	[4.42 - 5.15]	ref
Separated / divorced	351	(14%)	5.3	[5.11 - 5.58]	0.48*
Widowed	663	(27%)	4.8	[4.6 - 4.95]	0.12
Currently married	1,302	(53%)	4.9	[4.82 - 5.07]	0.14
Wealth					
First (lowest) quintile	522	(21%)	5.3	[5.09 - 5.49]	ref
Second quintile	487	(20%)	5.1	[4.91 - 5.33]	0.046
Third quintile	478	(20%)	5.0	[4.8 - 5.21]	0.031
Fourth quintile	484	(20%)	4.7	[4.51 - 4.91]	-0.25
Fifth (highest) quintile	499	(20%)	4.6	[4.4 - 4.79]	-0.31
Father's education					
No formal education	1,915	(78%)	5.0	[4.89 - 5.09]	ref
Some education	371	(15%)	4.8	[4.62 - 5.06]	0.0035
Father's occupational class					
Skilled	1,235	(50%)	5.0	[4.85 - 5.11]	ref
Unskilled	719	(29%)	4.9	[4.69 - 5.01]	-0.086
Other	271	(11%)	5.0	[4.76 - 5.29]	0.090
Don't know	241	(10%)	5.0	[4.66 - 5.27]	0.14
HIV status					
HIV negative	1,722	(70%)	4.9	[4.74 - 4.96]	ref
HIV positive	604	(25%)	5.2	[5.07 - 5.41]	0.18

Associations between life-course trauma and later-life wellbeing

In Table 3, we describe the associations between total exposure to adverse events and several binary measures of late-life wellbeing—presence of depressive symptoms (measured through the CES-D scale), presence of PTSD symptoms (measured through the short screening scale for PTSD battery), ADL disability (measured through reporting difficulty on one of five activities of daily living), and cognitive impairment (measured as in Kobayashi et al., in press). We see that increases in the number of adverse events experienced is significantly and substantially related to a higher odds of having depressive symptoms—each traumatic event is associated with about a 8% increase in the odds of having depressive symptoms. Similarly, adverse events are highly associated with PTSD symptoms, and a one unit increase in the number of adverse events an individual has been exposed to is associated with nearly a 16% increase in the odds of having PTSD symptoms, controlling for demographic characteristics. Adverse events are not only associated with psychosocial well-being among older adults—exposure to adverse events is also associated with increased likelihood of reporting an ADL limitation, with each additional event reported associated with an 10% increase in the odds of being ADL limited, controlling for demographic characteristics and SEP. However, we find no association between life-course trauma and later life cognitive health.

Though the linear parameterization of adversity used above has a number of benefits—ease of interpretability, ease of computation, and more direct comparability with other samples—it is likely that there is substantial heterogeneity in the later-life and life-course effects of exposure to these different events. That is, experiencing a violent attack or rape may associate with worse later-life outcomes than spending time caring for a sick or injured loved one. Table 4 presents an analysis breaking this total into the 5 categories from Table 1: childhood environment, social/family environment, illness/accident/disaster, community violence, and war violence. In this regression model, a binary variable was included for each of these categories, with a value of 1 if the individual had experienced 2 or more traumatic events in that category, and 0 if they had experienced 1 or no events in that category. This modeling approach seeks to investigate whether different types of life-course adversity are differentially associated with late-life health and well-being outcomes. We find that exposure to illnesses, accidents, and disasters, is strongly associated with later-life depressive symptoms, and that poor child environment is also somewhat associated with depression. As would be anticipated, individuals who experienced war violence are substantially more likely to report post-traumatic stress disorder symptoms, though individuals with high exposure to poor social/family environment, and high exposure to

illnesses, accidents, and disasters are also more likely to have PTSD symptoms. Individuals who experienced severe illnesses, accidents, and disasters are substantially more likely to report an ADL disability, suggesting that these traumas may have led to lasting physical consequences. We again see only limited associations between adverse events and cognitive well-being in later life—only the association with exposure to war violence is marginally significant.

Table 3: Association of adverse life-course events with depressive symptoms, PTSD, ADL disability, and cognitive impairment HAALSI 2015

	Depressive Symptoms	PTSD Symptoms	ADL Disabled	Cognitively Impaired
	b/se	b/se	b/se	b/se
Total # of adverse events	0.08***	0.16***	0.10**	0.05
	(0.02)	(0.05)	(0.03)	(0.04)
Birth cohort (1936-1945=ref)				
1946-1955	-0.32*	-0.01	-0.71**	-0.85***
	(0.16)	(0.29)	(0.24)	(0.24)
1956-1965	-0.54***	0.04	-0.73**	-1.29***
	(0.15)	(0.27)	(0.23)	(0.27)
1966-1975	-0.61***	-0.08	-0.66**	-1.98***
	(0.18)	(0.32)	(0.25)	(0.46)
Male (female=ref)	-0.16	-0.44*	-0.05	-0.21
	(0.11)	(0.21)	(0.18)	(0.20)
Level of schooling (none=ref)				
Some primary (1-7 years)	0.06	-0.01	-0.34	-1.23***
	(0.14)	(0.23)	(0.20)	(0.26)
Secondary or more (8+ years)	-0.27	-0.16	-0.58	-2.45***
	(0.19)	(0.31)	(0.31)	(0.73)
Born in Mozambique (SA=ref)	-0.24	-0.06	-0.01	0.43*
	(0.14)	(0.23)	(0.21)	(0.21)
Constant	-1.22***	-3.55***	-2.48***	-2.33***
	(0.25)	(0.45)	(0.38)	(0.36)
Observations	2437	2415	2437	2420

Notes: p-values: * p<.05, ** p<.01, *** p<.001.

Table 4: Association between categories of adverse life-course events with depressive symptoms, PTSD, ADL limitations, and cognitive impairment HAALSI 2015

	Depressive Symptoms	PTSD Symptoms	ADL Disabled	Cognitively Impaired
	b/se	b/se	b/se	b/se
Category of adverse events				
Child Environment	0.21#	0.17	-0.42#	0.03
	(0.12)	(0.21)	(0.22)	(0.23)
Social/Family Environment	0.18	0.36#	0.08	0.06
	(0.12)	(0.19)	(0.18)	(0.21)
Illness/Accident/Disaster	0.29*	0.35#	0.66***	-0.03
	(0.12)	(0.21)	(0.19)	(0.21)
Community Violence	-0.30	-0.13	0.32	0.17
	(0.31)	(0.49)	(0.40)	(0.49)
War Violence	-0.04	0.46*	0.17	0.37#
	(0.15)	(0.23)	(0.21)	(0.22)
Birth cohort (1936-1945=ref)				
1946-1955	-0.35*	-0.02	-0.95***	-0.80**
	(0.16)	(0.31)	(0.26)	(0.25)
1956-1965	-0.58***	0.10	-0.88***	-1.21***
	(0.15)	(0.27)	(0.23)	(0.27)
1966-1975	-0.64***	-0.01	-0.81**	-1.55***
	(0.18)	(0.31)	(0.25)	(0.40)
Male (female=ref)	-0.09	-0.43*	-0.06	-0.23
	(0.11)	(0.21)	(0.18)	(0.20)
Observations	2458	2434	2458	2440

Notes: Additional controls (coefficients not shown) Include level of schooling and country of birth (Mozambique vs South Africa)

DISCUSSION

In this paper, we aimed to understand the sociodemographic patterning and late-life consequences of life-course trauma in a cohort of older adults in South Africa. We find important differences, and similarities, to previous work exploring the long-term consequences of adversity in higher-income contexts. Exposure to traumatic events in the HAALSI does not follow the clear sociodemographic patterning commonly seen in higher-income contexts—wealth, education, and early-life SES were not protective against experiencing adverse life events. However, similarly to previous studies, greater exposure to trauma had substantial effects on later-life health and wellbeing, with strong associations seen between adversity and late-life depression,

PTSD, and functional disability. No associations between traumatic events and later-life cognitive well-being was seen, however, in marked contrast to much of the research evidence from higher-income contexts. In sum, our findings suggest that the legacy of systematic disadvantage and structural violence experienced by older Black South Africans continues to reverberate in terms of late-life psychosocial and physical well-being. Though the magnitude of adversity, and it's sociodemographic patterning, was very different from that experienced in most previously studied contexts, the later-life consequences appear generally similar.

The HAALSI population is composed of individuals who have lived through the structural oppression of Apartheid and a substantial number of former Mozambican refugees, who fled to the Agincourt region during Mozambique's 1977-1992 civil war. These cohorts bear the lasting legacy of apartheid, conflict, and systematic disadvantage. Exposure to extreme and adverse life-course events is high in this post-Apartheid, rural South African context, with only limited variation by SEP. This study was conducted in a rural, post-Apartheid context where the life course drivers of mental health and physical well-being have been only limitedly explored. Future analyses, using forthcoming longitudinal data on the HAALSI cohort, is needed to begin exploring the causal pathways leading to late-life health, as well as to explore potential protective behaviors or strategies for mitigating the impact of life-course adversity.

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