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# Black living standards in South Africa before democracy: New evidence from heights\*

BOKANG MPETA<sup>†</sup>, JOHAN FOURIE<sup>‡</sup> AND KRIS INWOOD<sup>§</sup>

Very little income or wage data was systematically recorded on the living standards of South Africa's black majority during much of the twentieth century. This paper uses four data sets to document, for the first time, an alternative measure of living standards: the stature of black South Africans over the course of the twentieth century. We find evidence to suggest that the first three decades of the century were particularly bad, perhaps due to the increasingly repressive labour policies in urban areas and famine and land expropriation that weighted especially heavily on the Basotho. The decade following South Africa's departure from the gold standard, a higher international gold price and the demand for manufactured goods from South Africa due to the Second World War seem to have benefited both black and white South Africans. The data also allow us to disaggregate by ethnicity within the black population group, revealing levels of inequality within race group that has been neglected in the literature. Finally, we compare black and white living standards, revealing the large and widening levels of inequality that characterised twentieth-century South Africa.

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## INTRODUCTION

The history of living standards in South Africa is complex but highly incomplete. For the period before democracy, we have at our disposal more individual-level statistical records of white descendants of European immigrants than of black South Africans, the indigenous, Bantu-speaking population that inhabited most of modern-day South Africa before the arrival of Europeans and have since formed the majority of the population. Meticulous records documenting white living standards, including production, wealth, income and wage series, were kept from the beginning of settlement<sup>1,2,3,4,5</sup> – but comparable information for black South Africans, with few exceptions, is frequently missing or unrepresentative of the entire population. A different approach is thus necessary to provide a more complete picture of the evolution of South Africa's living standards before the advent of democracy.

Our alternative route considers the biological measure of height, or human stature, that is documented in four unique data sources. Adult stature is a sensitive indicator of childhood well-being because individuals cannot realize their potential for physical growth if they are encumbered by poor nutrition, exposure to disease or undue physical labour.<sup>6,7,8</sup> Stature typically correlates with income and other measures of welfare except where the nature of economic change brings adverse consequences for child health.<sup>9,10</sup> Average height rises with socioeconomic class, for example, because higher class status brings improvements in nutrition and access to medical care.<sup>11,12</sup> Admittedly, the relationship between socioeconomic status and average height may be confounded by factors such as high food prices, and unsanitary or congested living conditions due to industrialization. Nevertheless, by analysing the mean height of a sample of black South African males over the 20<sup>th</sup> century, we shed light on the standard of living for a subsection of the population that has remained hidden for too long.

Our results respond to important questions in South African economic history: Were poor black living standards a result of apartheid-era policies, or did they worsen even before South Africa's most infamous era? When did white and black living standards diverge? Finally, and most difficult, can we explain the level and trend within the black population over the twentieth century?

Answering these questions complements the analyses of current-day inequality that rely on modern surveys with limited recourse to the past.<sup>13,14</sup> We already know, for example, black males born towards the end of apartheid were on average, as adults, at least 7cm shorter than white males. This is one of the highest within-country differences in the world, but we do not know when it emerged. A similar gap between white and coloured South Africans is known to extend back to the start of the twentieth century but as yet there is no comparable study of black South Africans.<sup>15</sup>

We use four unique sources. Firstly, we examine a sample of black Southern African men born between 1895 and 1927 who enlisted in the South African military between 1940 and 1945. Secondly, we consider a group of black men whose skeletons are protected in the Raymond A. Dart Collection of Human Skeletons in the School of Anatomical Sciences at Wits University.<sup>16</sup> Thirdly, we use the 1998 South African Demographic and Health Survey for men born after 1947. Fourthly, the 2008 National Income Dynamics Study (NIDS) survey data report the heights of men born after 1958.<sup>17</sup> Each of these sources requires careful analysis of its origin and the implications for sample selection and inference.

Our results show that black living standards as measured by height improved little over the 20<sup>th</sup> century, in contrast to other South Africans and people in other countries, most of whom experienced considerable growth in physical size. But this does not imply that black heights were unchanging. The events of the 20<sup>th</sup> century had varying effects in different periods and on different ethnic groups. The post-gold standard mining boom seem to have had large beneficial effects on black male heights, even though whites seem to have benefited more. In particular, Sotho men experienced the most change (at first negative and later positive) in living standards, while Xhosa men remained constant throughout the century. The number of observations is limited but sufficient to provide the first quantitative evidence of the adverse effects of early colonial labour policies and a new long perspective on black living standards over the entire twentieth century.

## A BRIEF HISTORY

The discovery of diamonds around 1870 transformed the economy of Southern Africa. Men of all races flocked to Kimberley to dig for diamonds.<sup>18</sup> The demand for labour meant salaries

for young, black men whose purchases of guns and ammunition, agricultural equipment and other sundries brought them influence and status back in their kingdoms.<sup>19</sup> Discrimination soon followed with a prohibition on claim ownership by black men. A system of migrant labour that initially developed to limit wage increases in the diamond mines was extended to gold mining following discoveries on the Witwatersrand two decades later. By the end of the nineteenth century white miners earned eight times as much as black miners.<sup>20</sup> Repressive and discriminatory labour practices in the early twentieth century institutionalized the wage gap.<sup>21</sup> A 'colour bar', for example, essentially reserved skilled and semi-skilled for white workers.<sup>22</sup> The consequences for physical health were stark: infant mortality in the Cape Colony was twice the level among Africans and Coloureds than among Whites.<sup>23</sup>

An erosion of agricultural incomes and thus bargaining power for non-agricultural work reinforced the effect of labour laws. Locusts, drought, rinderpest and wheat blight during the 1890s all but decimated subsistence agriculture and further drove down black bargaining power.<sup>24</sup> Nevertheless, legislation remained the most serious peril. The 1913 Land Act – which prohibited, amongst other things, the ownership of land by blacks – had devastating effects on the prospects of black farmers, forcing many into the non-agricultural job market.<sup>25</sup> In July 1913 Sol Plaatje undertook to investigate and publicize effects of the Native Land Act.<sup>26</sup> Plaatje reported that in Cape province the Act drove many back black farmers to “overcrowded locations” with poor sanitation (p 149). Grazing ground was limited, which led to the loss of cattle, an important source of nutrition and a crucial store of value. Not surprisingly a series of medical studies confirmed extensive malnourishment among Africans.<sup>27,28,29</sup>

Yet some improvement was underway. By the late 1930s infant mortality among Africans and Coloureds was declining, and real wages for black miners returned to pre-First World War levels.<sup>20,23</sup> Admittedly, mining remained relatively unhealthy, especially for black workers.<sup>30,31</sup> The gains in welfare, instead, reflect South Africa's departure from the gold standard in December 1932, which initiated a gold boom and a rise in mining's share of GDP from 15.6% in 1930 to 21.3% in 1933. Real GDP per capita increased to 5.1% annually during the 1930s compared to 2.2% the previous decade.<sup>32</sup> Fedderke and Simkins argue that the stimulus of the Second World War extended the boom triggered by rising gold prices.<sup>33</sup> Black workers benefited since mining was their largest employer after agriculture and the war-time diversion of white males created new opportunities for black as well as female labour.

The National Party's electoral victory in 1948 and the imposition of even more repressive policies changed the fortunes of black South Africans again. The 1951 Bantu Authorities Act and the 1959 Promotion of Black Self-Government Act, for example, had devastating consequences for blacks living in the new homelands. Not surprisingly, qualitative and quantitative evidence point to a marked increase in malnutrition among Africans in the 1950s.<sup>34</sup> These and other apartheid-era policies including unbalanced spending on education, health and pensions for different racial groups entrenched stark inequalities in incomes, living standards and life expectancy.<sup>35</sup> Yet already by the 1970s, social spending on black South Africans, mostly with the purpose of allaying black unrest, began to increase rapidly, with likely positive effects for black living standards.<sup>36</sup>

Despite ample evidence of race-based inequality over the twentieth century, trends in black living standards are difficult to determine, as Natrass and Seekings suggest (2015: 28): "It is not possible to identify precise levels and trends in poverty prior to the 1990s because the apartheid state made little or no effort to measure poverty among the black majority of the population, showing serious interest only in the living standards and conditions of white citizens".<sup>37</sup> As a result, no single indicator is available to construct a clear picture of the evolution of black living standards over the course of the entire 20<sup>th</sup> century. A directly comparable measure such as height can help in this regard.

#### SOURCES OF HEIGHT EVIDENCE

There is a long tradition of using height to monitor human welfare and the biological standard of living.<sup>11,38</sup> While genetic characteristics explain about 80% of stature variation within most populations, it is clear that nutrition, energy expenditure and disease exposure during childhood influence the ability of individuals to realize her or his height potential. A considerable body of literature now shows that environmental and socio-economic conditions rather than genetics explain most of the variation in height across societies, or even groups within a society.<sup>10,38,39,40</sup> Heights have also been used to study living standards in other African countries, like Kenya, Ghana and the Ivory Coast.<sup>40,41,42</sup> In a recent analysis of individuals born between 1951 and 1992 in 39 developing countries, Akachi and Canning find, for example, that a 1cm gain in cohort height is associated with a 6% increase in income per capita and 1.25 year increase in life expectancy.<sup>43</sup>

We use four data sets to investigate black living standards in twentieth century South Africa. Data describing 8172 black military recruits in the Second World War describes men born between 1895 and 1927 in and around South Africa. A smaller set of 500 observations is compiled from cadavers at Wits University with birth years between 1897 and 1980. The Demographic and Health Survey (DHS) measures the height of 2777 black South African men in 1998. Finally, the first wave of the National Income and Dynamics Study (NIDS) includes 2886 black men born between 1958 and 1990 from. Table 1 provides summary statistics for the three samples.

Table 1: Summary statistics for black male heights across the four sources

Black	N	Mean	Std Dev	Median	Min	Max	Age mean
WW2	8172	167.1	6.41	167.6	142.2	199.4	27.0
WITS	500	167.6	7.66	168.0	139.0	188.0	38.8
DHS	2777	168.1	7.97	168.2	128.5	198.4	30.9
NIDS	2886	168.8	7.63	169.0	128.5	199.8	30.1
Total	14335	167.7	7.07	167.6	128.5	199.8	28.9
Black, sa only							
WW2	6612	166.8	6.36	167.6	142.2	199.4	27.0
WITS	500	167.6	7.66	168.0	139.0	188.0	38.8
DHS	2777	168.1	7.97	168.2	128.5	198.4	30.9
NIDS	2770	168.9	7.61	169.0	128.5	199.8	30.0
Total	12659	167.6	7.12	167.6	128.5	199.8	29.1
Black, SA only, >22							
WW2	4420	167.4	6.41	167.6	142.2	199.4	30.7
WITS	491	167.6	7.69	168.0	139.0	188.0	39.1
DHS	2043	168.2	7.95	168.2	128.5	198.4	34.9
NIDS	1922	169.1	7.37	169.2	132.0	193.5	34.0
Total	8876	168.0	7.10	167.6	128.5	199.4	32.9

Although the average height across the samples are similar – increasing from 167.1cm to 168.8cm over the century – each selects a different subset of the population. We need to know what kind of men enlisted in the military in order to compare with the other samples and make inferences about the entire population. Similar selection issues apply to men whose cadavers are recorded. The Demographic and Health Survey is restricted to a subpopulation of men who are in a household with a woman aged 15 to 49. The NIDS data are largely

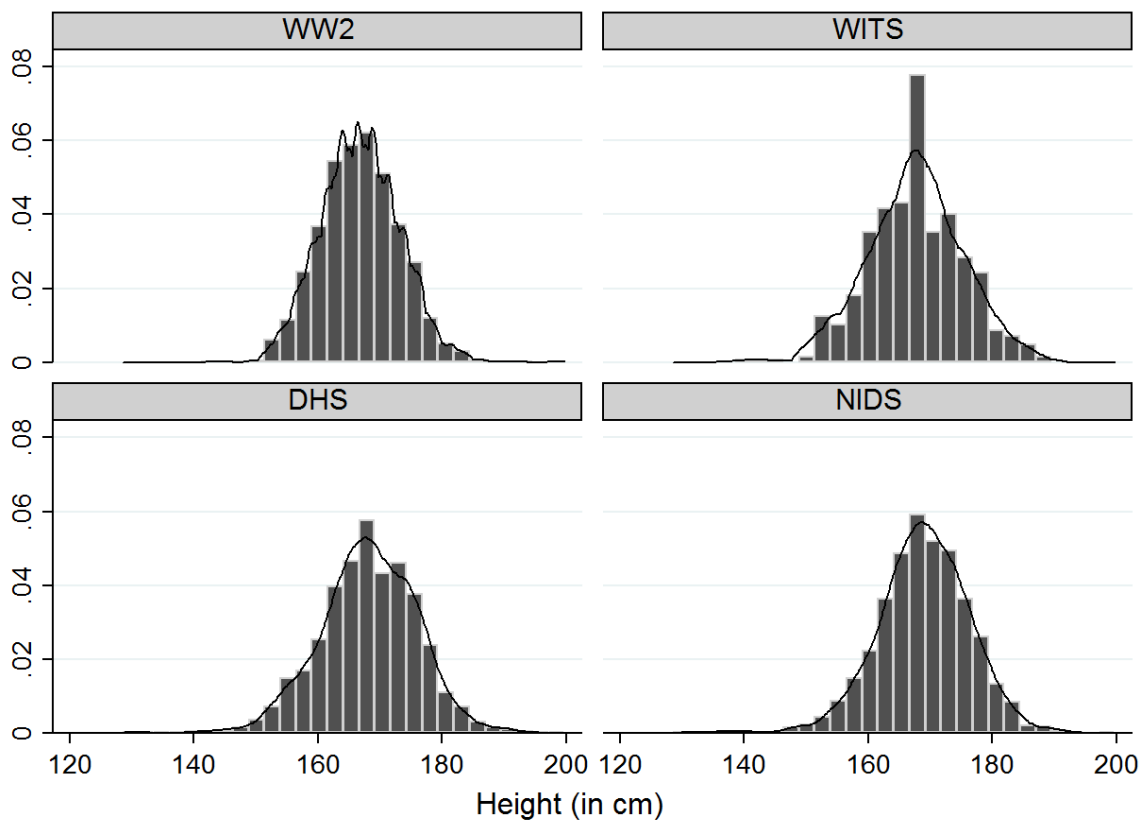
representative of the black male population, although small sample size creates some imprecision at less aggregate level. These selection issues are discussed below. Although our full sample includes all males between the ages of 18 and 50, most of the analysis will be on those between the ages of 23 and 50. This is because almost nobody grows taller beyond the age of 23 and men older than 50 years may start to shrink.<sup>44</sup> We undertake the analysis for men 18-50 years and again for men 23-50 years. See Figure 7 in the Appendix for a visual comparison.

We have transcribed a randomly-selected 14% of enlistment records for WW2 black soldiers, totaling 9128 records of which 8172 have minimally useful information. During the war these men worked in construction and as telephone operators, drivers and other non-combatant roles.<sup>45</sup> Figure 1 shows that there was little or no evidence of truncation at a minimum height (not surprisingly for non-combatants). Nevertheless, the standard deviation is smaller than in the other samples suggesting a preference for men of a certain height. As long as this truncation is not skewed, which it does not appear to be, our use of average height is unaffected. Some military enlistments tend to recruit men who were otherwise unemployed, and hence more likely to have grown up in resource-poor households and to be shorter than average. This does not appear to be the case here. The black soldiers reported a wide range of pre-war occupations. Subsistence agriculture is under-represented but in other respects the occupational profile reflects the diversity of work contributed by blacks to the South African economy.

Our second source, the Raymond A. Dart Collection of Human Skeletons at the University of the Witwatersrand derives from 2605 bodies that were otherwise unclaimed from regional (Southern African) hospitals. 76% of the skeletons are of black Southern Africans, and 71% are male.<sup>16</sup> While most males died between the ages of 20 and 70 – the reason for death is often included – we limit the sample to 500 skeletal measures describing men between the ages of 18 and 50 years. Although the Dart collection is not demographically representative, it has the advantage of identifying ethnicity, place of birth and cause of death for men who died over an extended time span.<sup>16</sup> Although this sample is small, it shows no evidence of truncation at either side of the distribution. The mean and standard deviation of height are similar to that of the NIDS data, which are nationally representative.



Figure 1: Histograms of four sources



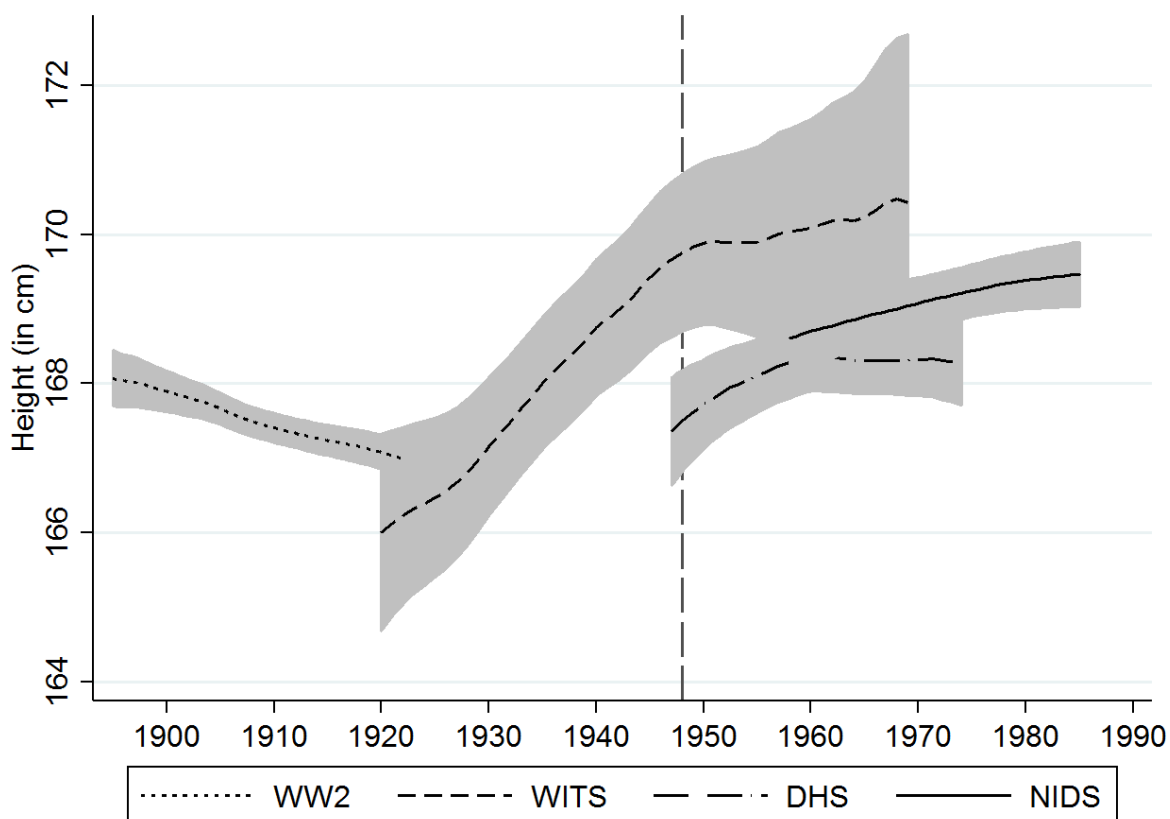
Because the principal aim of the South African Demographic and Health Survey (SADHS) was to produce reliable demographic estimates, it included a stratified sample of approximately 12,000 women between the ages of 15 and 49. In addition to the main survey of households and women, however, an adult health module was administered to a sample of adults, including men, aged 15 and over in half of the households selected for the main survey. The survey, therefore, only includes men that are members of a household where a woman between the ages of 15 and 49 are present. This may introduce a bias in the sample, although the direction of the bias is unclear.

Our final sample comes from the 2008 round of the National Income Dynamics Study (NIDS), a nationally representative survey.<sup>17</sup> We use data describing black males born after 1958 and before 1990. Several outliers describe men who are implausibly short; we remove all outliers that are shorter than 125 cm, roughly four standard deviations from the mean. Figure 1 plots the distribution of height in the NIDS sample.

## BLACK LIVING STANDARDS IN THE TWENTIETH CENTURY

We first plot the height of black men over the twentieth century for each of the samples separately. Figure 2 shows the results for black, South African men between 23 and 50 years of age. The grey area indicates the 95% confidence interval.

Figure 2: Heights of black men by birth years, separate samples, 1895-1990

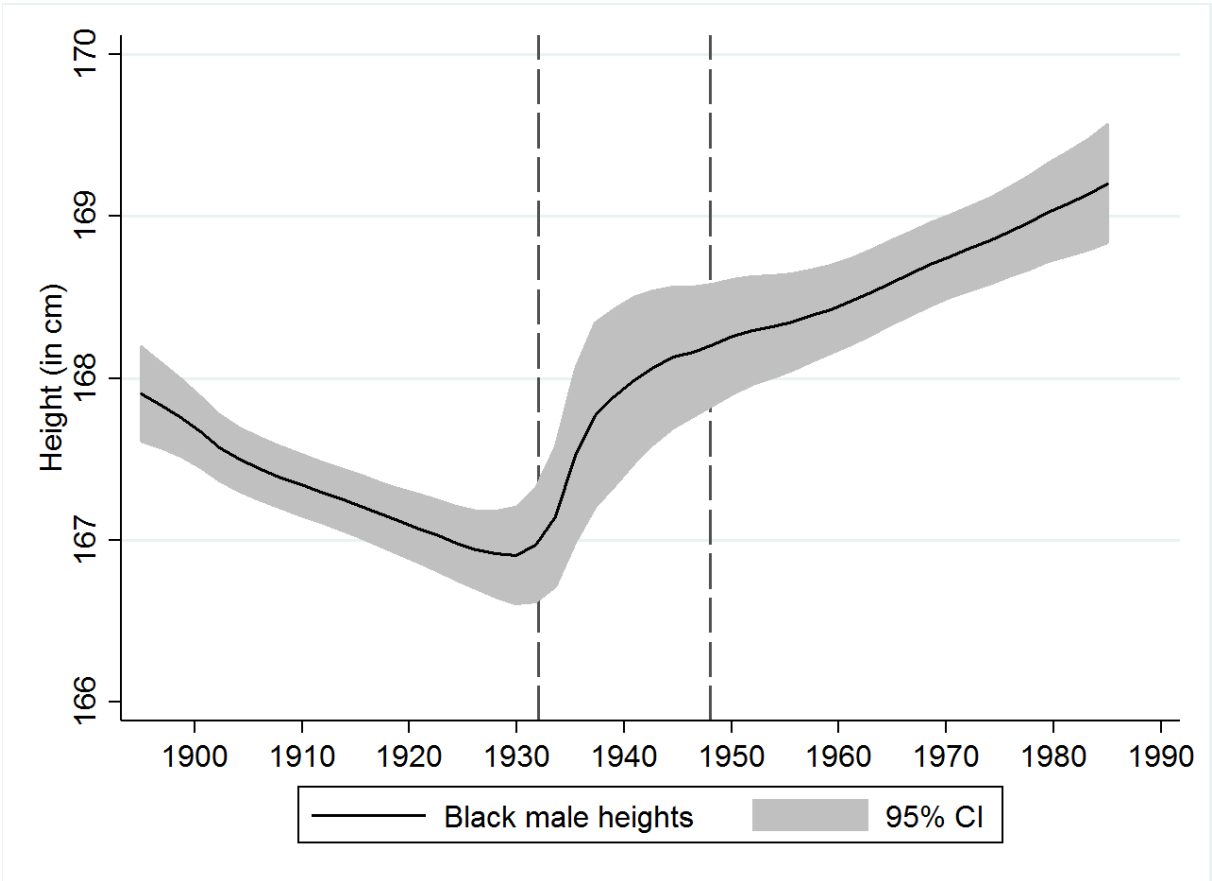


The WW2 sample reflects a clear decline in living standards during the first two decades of the century. The small sample size of the Dart Collection (WITS) is reflected in the wide confidence intervals around the trend (see, also, Figure 9 in the Appendix). Average height in the mid-1920s is nevertheless similar in both the WW2 and WITS samples, at 167cm.

The most obvious disconnect is between the WITS and DHS samples in 1947, with a 2cm difference. Both most likely suffer from a downward bias. Support for this downward bias in the DHS sample is found when compared to the nationally representative NIDS dataset. The WITS sample, however, seems to be upwardly biased in comparison to NIDS. The true average in 1947 is therefore likely somewhere in-between these two samples, at just above 168cm.

We combine the four sources into one series in Figure 3, which plots a locally smoothed polynomial (of bandwidth 8) of black male heights by birth year (for men 23 years and older) across the twentieth century. This is the first representation of black male living standards using micro-level evidence for such a long period.

Figure 3: Heights of black men by birth year, 1895-1990



Black males born during the late nineteenth century were on average 168 cm tall. Average height then fell by 1cm to 167cm over the course of the next three decades suggesting a strong deterioration in living standards. A decline in height from 1910 to 1930 occurred during the introduction of increasingly more repressive and discriminatory legislation against black workers, as noted above. Figure 3 shows a sharp turnaround around 1930, when black heights increase by around 1cm in 10 years. The most likely explanation for this turnaround is South Africa’s decision to leave the gold standard in December of 1932 (indicated by the first vertical line), which boosted production in the mines and with it employment for black men. This increase in heights seems to slow down after 1940. Although this rapid rise may be overstated

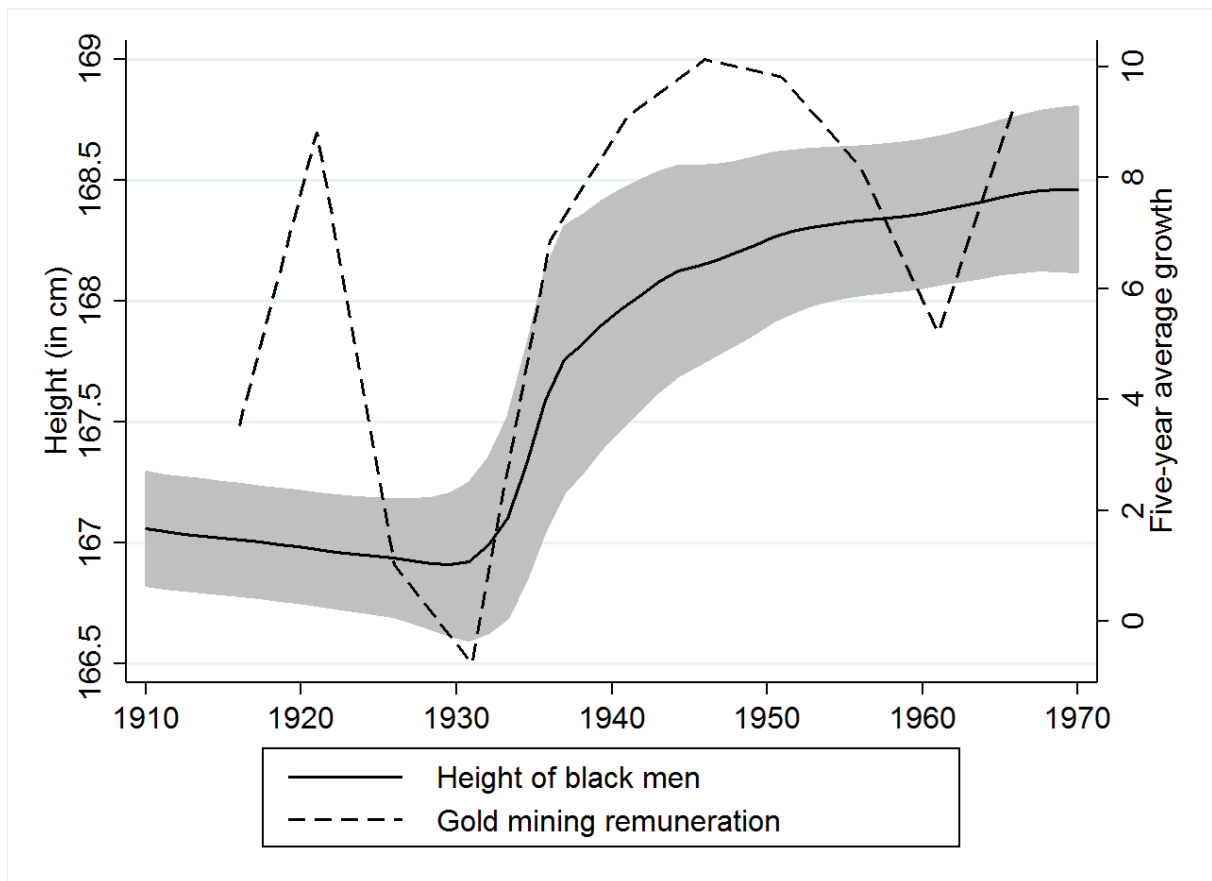
because of small sample size, there is no doubt that the heights of black men increase by at least one centimeter between 1930 and 1948, when the National Party won the elections and introduced its policy of apartheid (indicated by the second vertical line). The rise in the 1930s is somewhat less steep if the WITS sample is removed, but the general trend remains (see Figure 8 in the Appendix). After 1948, black male heights increase by another centimeter until the mid-1980s, when our sample period ends.

Whether the samples are representative of the national population is just one of many possible selection biases when using heights as a measure of living standards. Bodenhorn et al., for example, caution that changing labour market conditions may influence a worker's decision to opt for military service.<sup>46</sup> In particular, an increase in private sector wages may divert the best and brightest (i.e. tallest) from military service and create the appearance of stature decline in enlistment records. This kind of selection effect is not immediately relevant here because height and private sector real wages in 1930s South Africa moved in the same rather than opposite directions.

As a further check to determine whether we are not simply capturing 'class' effects, we restrict consideration to black males who worked in mining. The WITS data have no occupational detail so we instead assume all deaths related to 'lung', 'pneumonia' or 'respiratory' diseases were mine workers, based on the strong correlation between these diseases and mining employment.<sup>47</sup> The trend reflects the same pattern as above, although with larger confidence bands owing to the smaller sample size.

Figure 4 overlays remuneration in gold mining with the heights of black men by year of birth. A positive correlation is evident: employment and real wages in gold mining remuneration expanded significantly during the 1930s just as height increased. Rising mining profits also increased local municipal tax revenue. A part of this additional revenue was used to finance, in 1934, the construction of a new suburb – the south-western township (Soweto), to improve the living conditions of mine workers.

Figure 4: Black male heights and growth in gold mining remuneration



We posit that income growth for mine and other urbanised workers would have been key in improving health and nutritional outcomes for their children, which in turn contributed to the growing stature of men born in the 1930s. Admittedly, these are mere correlations. But, as Mariotti show for South Africa in the 1970s, there is some evidence to causally link higher mining wages of fathers to improved stature of sons.<sup>48</sup> We would argue that the trend in remuneration is, in the least, supportive of our hypothesis that heights increased significantly during the 1930s because of an expanding mining and manufacturing sector. It was not only in mining where employment opportunities for black workers improved. Terreblanche (2002: 344) notes: “Although the creation of job opportunities for whites was an important justification for launching ESKOM and ISCOR, both deviated from this intention. Even before World War II both corporations were increasingly replacing whites with blacks, gaining significant control over their workforce and their ability to make profits”.<sup>22</sup>

We emphasize the impact of the mining sector because it employed large numbers of black males throughout the twentieth century. In 1911, 21.7% of adult black men in South Africa were employed in the mining sector.<sup>49</sup> By 1996, mining still employed 12.8% of all adult black

men.<sup>50</sup> But by emphasizing mining’s contribution to the improvement in black living standards, we do not wish to dismiss other possible causes, including improvements in public health, urbanization and general income levels. We hope that future research will be able to identify the economic significance of these and other causes.

#### WITHIN-GROUP DYNAMICS

We move beyond these general trends to examine diversity of well-being within the black population, a topic that has not received a lot of attention in South African economic history. Each of our sources identifies either the ethnicity or the language group of each individual. For this analysis we exclude records for which ethnicity is missing, or is simply indicated as ‘Black’ or ‘African’. Here, however, we include individuals born outside South Africa’s borders if they share the ethnicity of South Africans, like the Basotho of Lesotho. In the end, we classify nine black ethnic groups using contemporary classifications of those ethnicities – Ndebele, Pedi, Sotho, Swazi, Tsonga, Tswana, Venda, Xhosa and Zulu – summarized in Table 2.

Table 2: Summary statistics for black male heights by ethnicity, 1895-1990

Black men	N	Mean	Std Dev	Median	Min	Max	Age mean
Ndebele	215	167.7	6.51	167.6	146.8	185.4	33.8
Pedi	1409	168.0	6.52	167.6	141.3	190.5	29.3
Sotho	1654	167.4	7.13	167.6	130.5	198.1	28.6
Swazi	428	168.8	7.09	168.3	148.8	193.5	29.2
Tsonga	410	169.1	7.45	170.2	135.0	192.7	27.7
Tswana	1419	167.3	7.27	167.6	128.5	198.4	28.5
Venda	303	168.4	7.23	167.6	132.0	185.0	29.3
Xhosa	1947	167.2	7.56	167.5	128.5	199.8	29.6
Zulu	2223	167.9	7.47	167.8	132.4	199.4	29.9
Total	10077	167.7	7.25	167.6	128.5	199.8	29.3

There is some height variation between the different groups. The average gap over the century between the shortest, the Xhosa, and the tallest, the Tsonga, is almost two centimeters. These differences may be attributed, in part, to the distribution of observations by ethnicity across the century. All nine ethnicities are represented in each of the sources, although relative proportions differ. Xhosa and Zulu men, for example, are proportionally less important than Sotho in the sources describing the first half of the twentieth century and more

important than Sotho in the second half of the century. Accordingly, we describe in Figure 5 temporal change within each of three large groups, the Xhosa, Sotho and Zulu.

Figure 5: Black male heights by ethnicity, 1895-1990

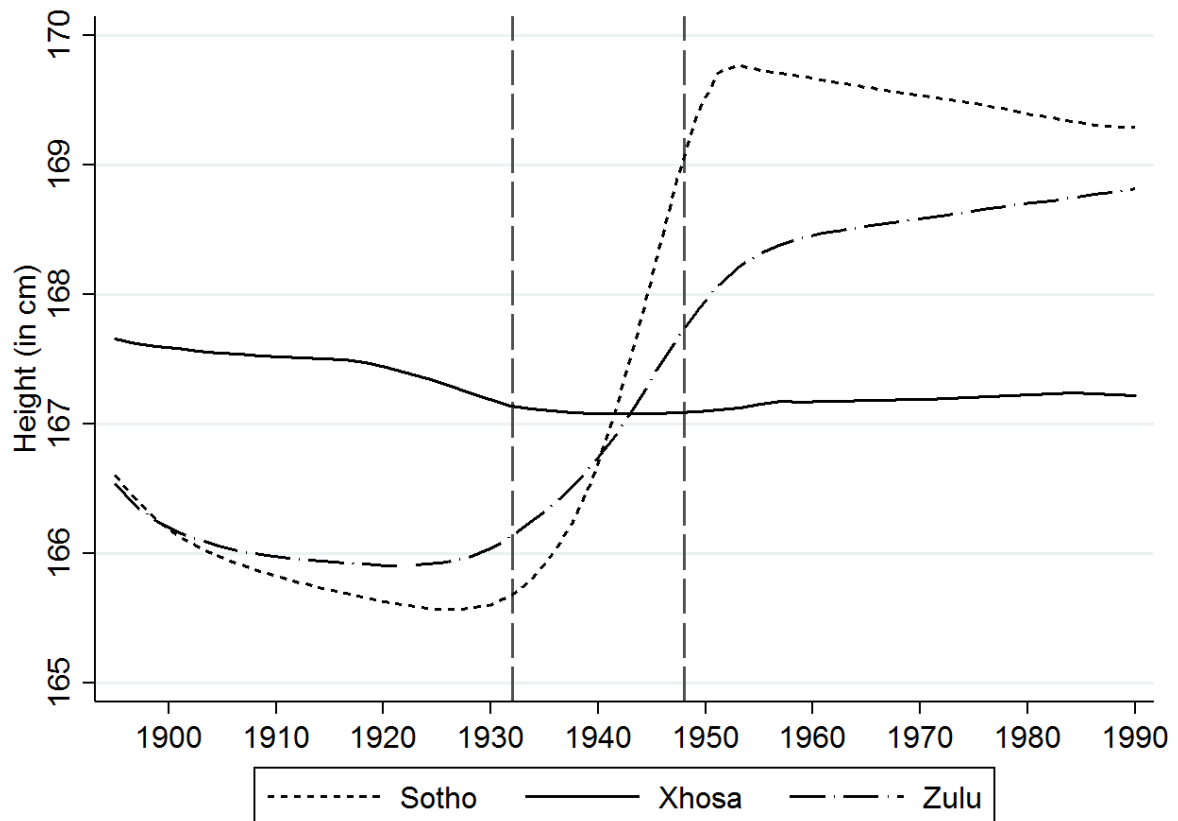


Figure 5 clearly shows that the three ethnicities experience different patterns of change over the century. Xhosa male heights changed little over the twentieth century, while the stature of Sotho men fell during the first three decades. The historical literature suggests two possible explanations for the divergence. First, Sotho men in the early twentieth century increasingly moved to urban areas around the mines of Johannesburg and to poorly remunerated employment requiring limited skills. Second, and perhaps more importantly, the great famine in Basotuland had long-lasting effects for the Sotho. Although there was some reprieve during the Anglo-Boer War as Basotho horses were in high demand by the British, disaster struck again in 1903, when food was imported into Basutoland for the first time. “Lesotho, once the grain basket of the Cape Colony and the Orange Free State, was no longer self-sufficient in food production” (p. 81).<sup>51</sup>

The ranking between the three ethnicities of Figure 5 changed after 1932, when South Africa left the gold standard and mining production soared, when the heights of Zulu men but especially Sotho men increased rapidly. This is not surprising; of the three groups, Sotho men would have been most likely to work in and around the mines and thus benefit from the increased labour opportunities and better living conditions available after the 1930s. Zulu heights also increase significantly, and then flatten somewhat during the later period.

**BLACK LIVING STANDARDS IN COMPARISON**

Black living standards did not evolve in isolation. We next compare the trend in male heights for blacks and whites. We have the same four sources of data for whites, and in addition we use early twentieth century police and military data from World War I, the Cape Mounted Police, the South African Constabulary and attestations of sixteen smaller forces. Fourie, Inwood and Mariotti describe this source.<sup>52</sup> Figure 9 in the Appendix show the number of observations by year. Some of these forces required a minimum height implying that their stature may have been slightly greater than the population. The effect of the minimum height requirements was limited because South African whites were tall relative to the minimum and, as is argued elsewhere, the requirements became less relevant over the course of the twentieth century because of technological change in warfare.<sup>53</sup> Summary statistics are provided in Table 3.

Table 3: Summary statistics for white male heights across four sources

White men	N	Mean	Std Dev	Median	Min	Max	Age mean
WW1	2066	173.8	6.55	174.0	144.8	196.9	27.1
WW2	4960	174.3	6.72	174.6	149.9	208.3	31.6
WITS	27	175.0	7.36	176.0	157.0	188.0	43.3
DHS	233	179.1	6.85	179.1	160.0	198.0	36.6
NIDS	139	178.2	7.15	178.2	153.0	198.5	37.8
Total	7425	174.4	6.76	174.6	144.8	208.3	30.7

Figure 6: Black and white heights over the twentieth century



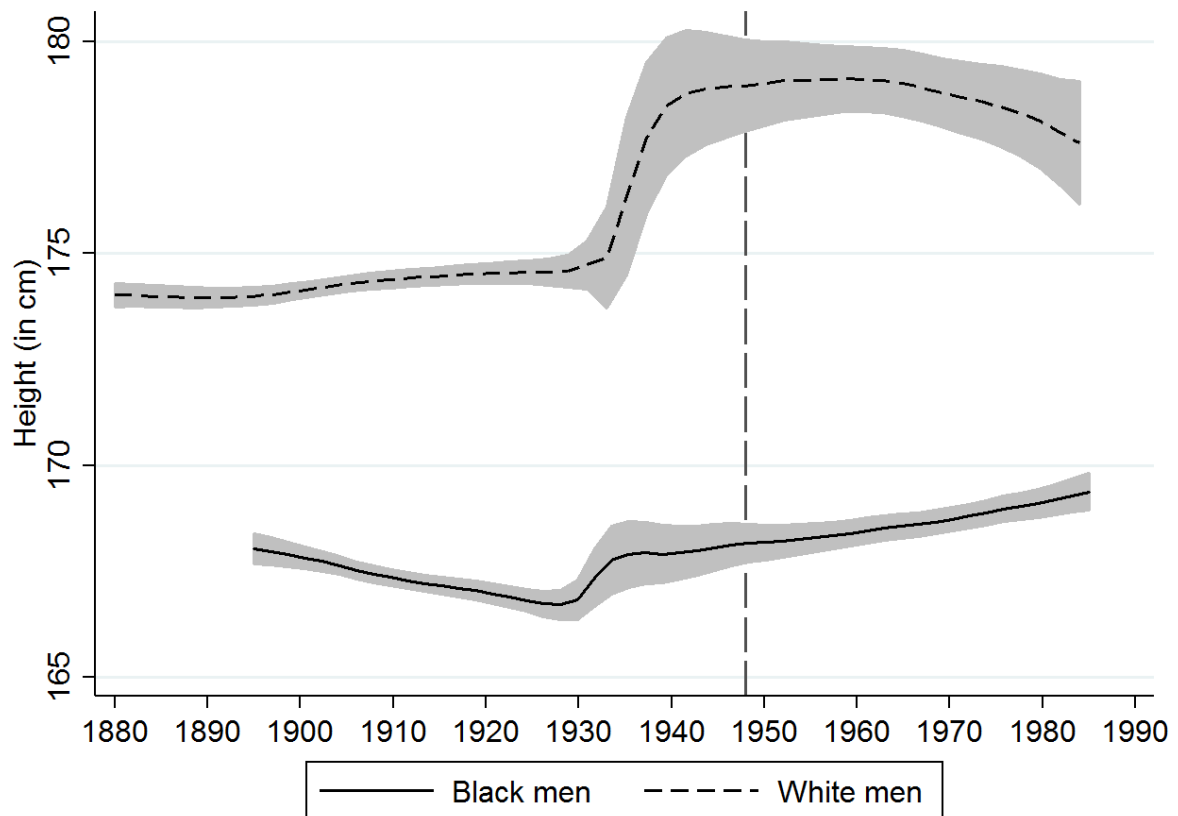


Figure 6 compares white and black male heights over the twentieth century. Three things are immediately apparent. First, whites were markedly taller than blacks throughout the twentieth century. The confidence intervals at some stages are large owing to the few observations available to us, but the two lines never overlap. Second, the prodigious increase of the 1930s was not a unique experience for black workers. In fact, the heights of white men seems to have increased three centimetres over less than two decades, confirming the economy-wide impact of the mining and Second World War boom. Unfortunately, it is hard to say more about this important experience given the few observations and explanatory variables for this period. Third, the seeming decline of white stature during the apartheid era (in contrast to a small rise in the heights of black men) must be regarded with caution; the current sample size is insufficient to be confident about whites in this period.

## CONCLUSIONS

Owing to the lack of adequate micro-level evidence, the living standards of black South Africans before democracy remain poorly understood. This paper contributes to filling this

gap. We use three data sources on the heights of black South African men to confirm the experience of persistently poor living standards across the twentieth century.

We find evidence to suggest that the first three decades of the century were particularly bad, perhaps due to the increasingly repressive labour policies in urban areas and famine and land expropriation that weighted especially heavily on the Basotho. The decade following South Africa's departure from the gold standard, a higher international gold price and the demand for manufactured goods from South Africa due to the Second World War seem to have benefited both black and white South Africans. Unfortunately this progress slowed down in the late 1940s, which coincided with the introduction of further repressive and discriminatory policies that comprising apartheid policy. Chief Albert Luthuli (p. 233) has summarised the overall impact of these laws on black South Africans:

“The past thirty years have seen the greatest number of Laws restricting our right and progress until today we have reached a stage where we have almost no rights at all: no adequate land for our occupation, our only asset, cattle, dwindling, no security of homes, no decent and remunerative employment, more restrictions to freedom of movement through passes, curfew regulations, influx control measures; in short we have witnessed in these years an intensification of our subjection to ensure and protect white supremacy.”<sup>54</sup>

Our evidence attests to the importance of these comments and point to an important way in which the welfare of black South Africans stagnated as other populations were able to realize a considerable growth of physical stature during the second half of the twentieth century.<sup>55</sup> The slow increase in black heights during the second half of the twentieth century do suggest that economic growth, continued urbanization, public health provision and the redistributive policies towards the end of the apartheid era, even if from a very low base, contributed to an improvement in black living standards.

The average trend in black male heights masks important within-ethnic trends. Such inequalities within the black population have, as far as we know, not been adequately examined or explained. Our analysis of heights show that, while the heights of Xhosa men remained relatively unaffected over the twentieth century, those of Sotho men declined and

then increased significantly during the 1930s. The decline, we posit, might be explained by the expropriation of land, and the increase by greater access to employment, even of semi-skilled and skilled positions.

These results allow us to compare black South African heights to those of white South Africans. The roots of the interracial inequality, we show, are not limited to South Africa's apartheid era, but lie deep in the history of segregation, exploitation and appropriation that characterised nineteenth- and early twentieth century South Africa.

And what about the future? What are the prospects for a convergence and reduction of the black-white stature gap? Is it possible that genetic inheritance perhaps via epigenetic pathways contribute to the patterns identified in this paper thus reducing the prospects for improvement. From a biogenetic perspective, the question cannot be answered clearly because gene-level understandings of human stature remains incomplete.

A possible answer is to look for societies where genetic inheritance is similar, but where there are large within-group differences that can only be attributed to socio-economic factors. Korea provides one example. Pak shows that while South and North Koreans born during the 1940s were of similar height, the adult heights of North Koreans in subsequent generations have stagnated while the heights of South Koreans have increased by 6cm, the same gap between black and white in South Africa at the start of the twentieth century.<sup>56</sup> Examples of different ethnic groups converging in heights as socio-economic conditions improve comes from the experience of Māori and white (Pākehā ) New Zealanders since WWII.<sup>57</sup> While the height gap between the Māori and whites were 3 cm for those born during World War II, this gap disappeared for children born during the 1980s as a result of economic growth and better public health and other social policies. These and other population-level anthropometric studies point to the possibility, at least in the long run, for convergence of stature among different ethnic groups in South Africa.

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Appendix

Figure 7: Black male heights with different age limits, 1895-1990

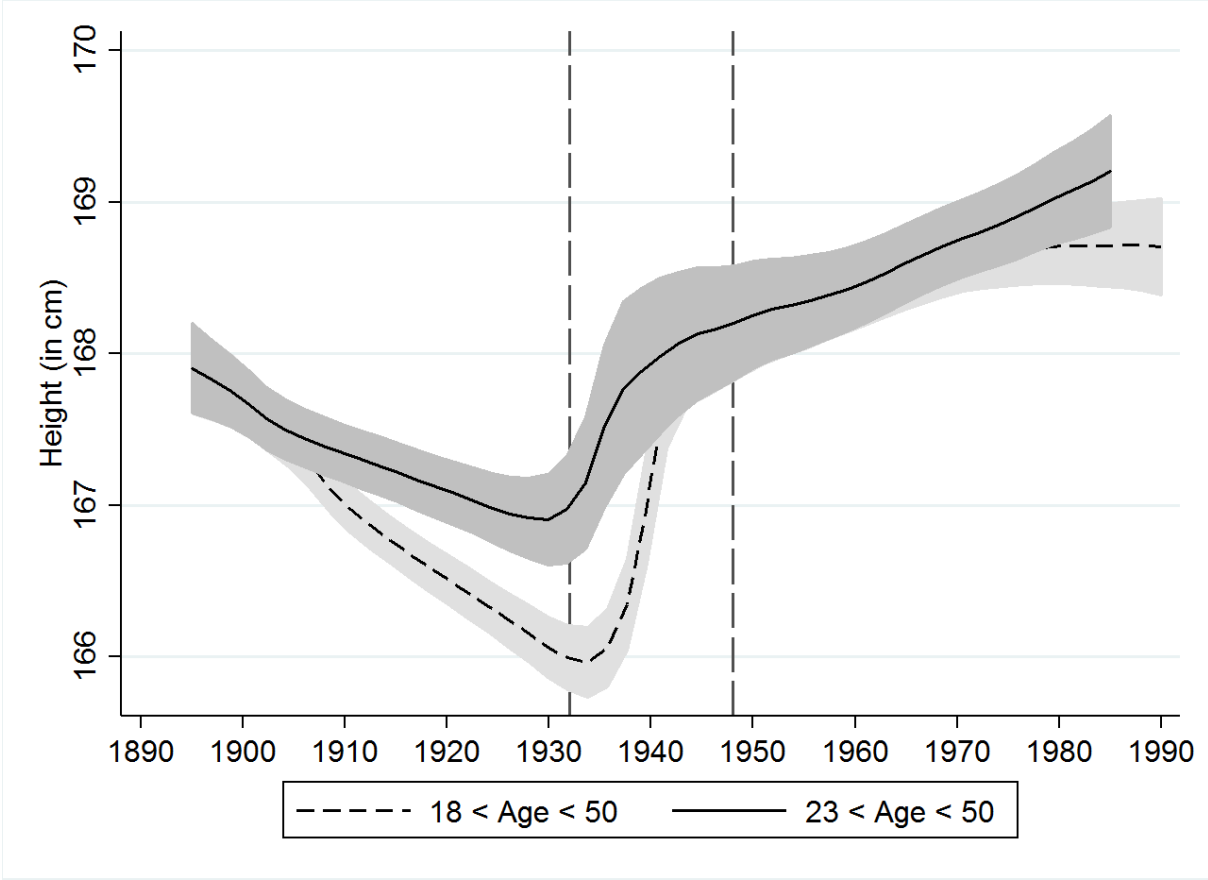


Figure 8: Black male heights with and without including the WITS sample, 1895-1990

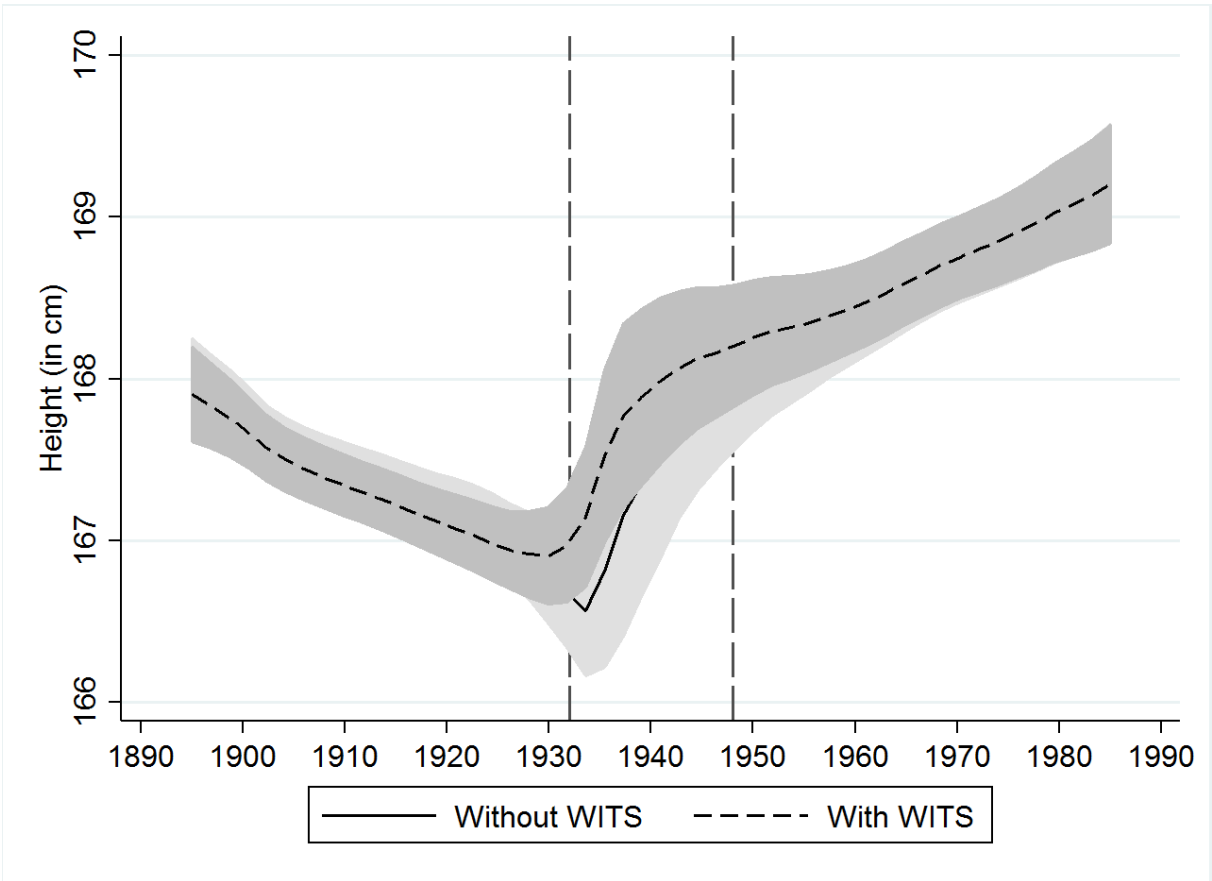


Figure 9: Histogram of distribution of observations, black and white men, 1885-1990

