INFANT MORBIDITY ASSESSMENT IN SOUTH AFRICA

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Abstract

A profound indicator of public health is the quality of life of the infants in a population as they are the primary beneficiaries of a health system. An assessment of infant morbidity in contrast to infant mortality is pivotal in policy formulation and evaluation especially in terms of socioeconomic differentials to accessing health facilities. Research has attributed morbidity to sanitation issues, which included lack of electricity or piped water, parental literacy levels, anthropometric measures such as birth weight, and socioeconomic conditions. In particular, poverty has been singled to be a significant influence on health as it determines an individual's environmental risks and access to resources to deal with those risks. This presentation will investigate infant morbidity in South Africa based on gender, race, settlement, province, and economic class. Chi-square tests of association and analysis of variance were conducted to assess the influence of the socioeconomic differentials on morbidity with a view to influence public health.

Key Words: association, poor resource settings, socioeconomic differentials, sustainable health

1. INTRODUCTION

A profound indicator of public health is the quality of life of the infants in a population as they are the primary beneficiaries of a health system. Habib *et al* (2009) noted that infant morbidity and mortality are important measures of a nation's health because of their association with a variety of factors such as maternal health, quality of medical care, socioeconomic conditions and public health practices. An assessment of infant morbidity in contrast to infant mortality is pivotal in policy formulation and evaluation especially in view of the racial, gender, place of residence, family's economic class and provincial access to health facilities. Unlike mortality, which assesses the quantity of life, morbidity is essentially informative especially in the presence of socioeconomic differentials which have to be considered in health access assessment. Muhe *et al* (1995) attributed morbidity to sanitation issues, that included lack of electricity or piped water, and parental literacy levels, whilst Habib *et al* (2009b) asserted that birth weight and socioeconomic conditions were fundamental determinants of morbidity. Kulmala *et al* (2000) noted that morbidity was associated with the child's area of residence, weight in early life, number of siblings, father's marital status and the family's source of drinking water. Ogunjuyigbe *et al* (2006) acknowledged that poverty had a significant influence on health as it determined an individual's environmental risks and access to resources to deal with those risks; hence place of residence and province are of paramount significance in the study of infant morbidity.

An understanding of infant morbidity plays a significant role in resource allocation especially on health issues in poor resource settings as the inhabitants of such communities are vulnerable. Ogunjuyigbe *et al* (2006b) also noted that political marginalization and social exclusion worsened the association between poor health and poverty and child survival. The findings of this study will impact positively on the South African government's resource allocation by gender, race, place of residence/settlement, province, and economic class on health matters with the objective of sustainable health for all its citizens.

This paper aims to assess if there were any associations between health (*measured by infant morbidity*) and the socioeconomic status of South Africans as well as to ascertain any meaningful relationships between the anthropometric measures and the five differentials, gender, race, place of residence/settlement, province, and economic class.

2. DATA AND METHODOLOGY

The National Income Distribution Study (NIDS) is a governmental initiative study under the auspices of the President's office undertaken by the University of Cape Town's Southern Africa Labour and Development Research Unit (SALDRU). It is an investigation of the impact of income dynamics in the welfare of the South African population. Data was collected from the child questionnaire of the NIDS Wave 1 study of 2008 and the sample consisted of 3845 infants. An infant in this case, was considered to be a child between 0 and 5 inclusively. A cross-sectional study design was employed and ethical clearance was obtained from the ethical review committee of the University of Cape Town under the auspices of SALDRU.

The variables of interest on health facility access were place of birth, possession of birth certificate¸ possession of clinic card, routine check-up, and medical aid. Each one of these measures the accessibility of the general populace to basic health which has a bearing on their quality of life. Place of birth is of essential concern in alleviating deaths as well as disabilities on the part of infants, this also has an implication on regularization of birth records. Routine check-ups and medical aid offer an impression of over time health assessment especially for infants who have to be immunized frequently.

The variables of interest on anthropometric measures considered in this project were birth weight, head circumference at birth, height, weight, waist circumference and body mass index (BMI) in 2008. These variables are of importance in assessing the health of infants in relation to that of their mothers which have a bearing on the nutritional and physical health of the population in general and in the presence of ailments such as HIV/AIDS and poverty.

Descriptive analysis was conducted for explorative purposes as well as to give an overall description of the data collected. These included tabulations, plots of graphs, and computation of summary statistics, specifically the mean and the median.

Inductive analysis was done using t-tests, chi-square test, the ANOVA test based on the differentials of gender, place of residence, province, and economic class. The significance level used was α being equal to 0.05.Data was analyzed using the STATA version 11.

3. RESULTS

There was an almost equal representation of each age within the sample and the mean age of the infants was 2.44 years. The sample consisted of 50.82% male and 49.18% female infants, 83.28% of the infants were of African descent and the least represented race was Asian Indian with 0.96%. The majority of infants incorporated in this study were from KwaZulu-Natal province, 31.21% of the sample size, whilst the minority of infants was from Free State province which had 4.81%. The dominating settlements where infants resided were tribal authority (48.87%) and urban formal (34.62%) of the infants. The distribution of the infants in terms of economic class showed that 44.24% of them were from middle class families, 32.35% from lower class and 23.41% were from the upper class.

3.1 Access to health facilities

Most infants' birth (83.72%) took place in hospitals, 10.01% at clinics and 6.27% of births occurred at home. The majority of births which occurred at home were female infants, while most hospital births were of male infants. The race which dominated home births was African, constituting 89.74% and there were no home births for both Asian Indians and whites. Formal urban infants were born mainly in hospitals whilst 57.26% of home births occurred in tribal authority areas. It was also noted that 14.48% of formal rural births occurred in homes. KwaZulu-Natal province had 31.20% of home births, whilst within province analysis revealed that the Eastern Cape (9.07%) and Mpumalanga (9.05%) dominated in home births. Most hospital births occurred in the Northern Cape, Free State and the Western Cape provinces, respectively. The amongst economic classes investigation showed that the middle class 54.70% of the home

Birth certificate possession was 92.19% of the infants. Male infants constituted 52.92% of those who had no birth certificates and female infants took the remaining 47.08%. All Asian Indian and white infants had birth certificates whilst a mere 3.27% of the colored infants had no birth certificates. The glaring revelation is that 94.50% of the infants with no birth certificates were of African descent, though this just constituted 8.82% of African infants. A within residential set-up analysis of possession of birth certificates shows that infants from formal rural constituted 14.02% whilst a comparison across residential set-ups showed that tribal authority areas took 58.42%, of infants with no birth certificates. KwaZulu-Natal province had 46.05% of the infants who had no birth certificates. Considerable low percentages were prevalent in the Northern Cape and Free State provinces of infants with no birth certificates. The lower economic class dominated with 48.45% of infants with no birth certificates.

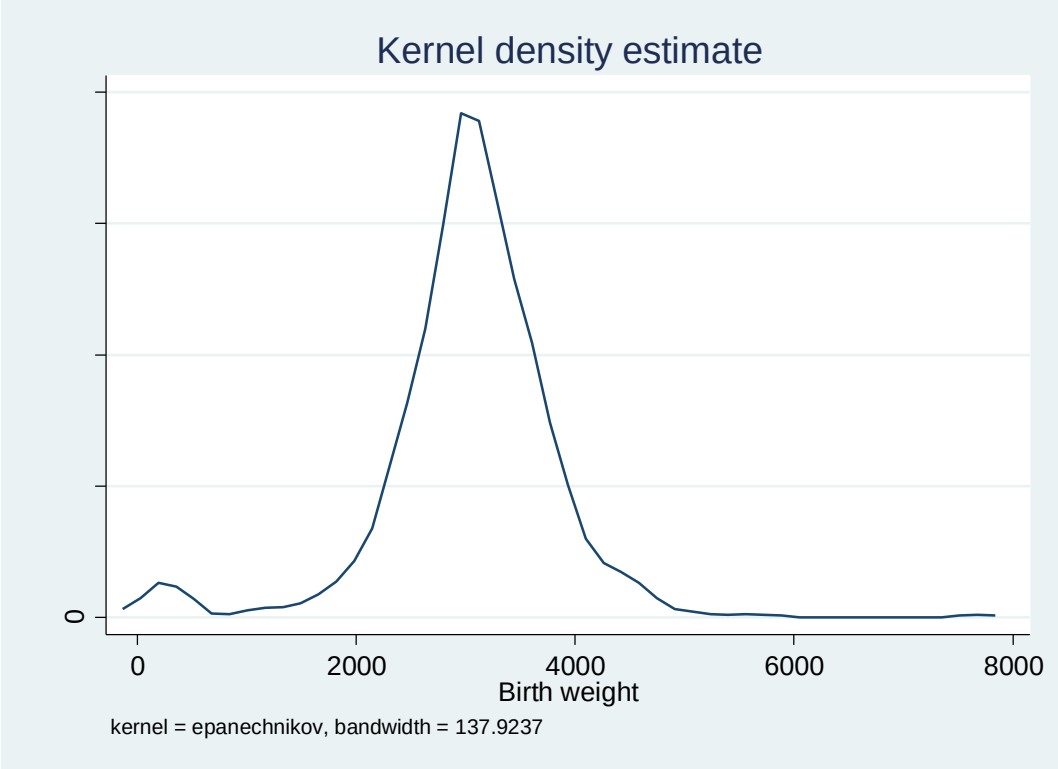
3.16% of the infants had no clinic card and 96.84% of them had a clinic card. This shows that most South African children regardless of birth place were guaranteed of getting a clinic card. The infants without a clinic card consisted of 54.31% males and 45.69% females. Across races, African infants constituted 81.90% of infants without clinic cards whilst within races white infants dominated with 3.66% of those infants without clinic cards. The tribal authority settlements had 50% of the infants who had no clinic cards and a within residential area comparison shows that the formal rural area dominated with 5.45% of its infants without clinic cards. KwaZulu-Natal province, in both across and within provinces analysis on infants without clinic cards, dominated with proportions of 0.431 and 0.0429, respectively. 47.41% of infants who had no clinic cards were from the middle class families.

Overall, 31.47% of the infants did not have any routine medical check-up, with a moderate 23.63% having only one check-up in the preceding 12 months and a modest 44.90% having had routine check-ups for more than once. There were no significant differences in the proportions of male and female infants on attendance of routine medical check-ups (*p-value>0.05*). Amongst the infants who had no routine medical check-ups, 85.98% were of African descent while a negligible 0.35% was of Asian Indian race. Infants from tribal authority areas constituted 56.01% of those who had no routine medical check-ups. KwaZulu-Natal province dominated both within and across province comparison of infants who had no routine medical check-ups with 38.12% and 38.15%, respectively. 45.3% of infants who never attended a routine check-up in the past 12 months were from middle income class families. Elsewhere, 44.32% of infants who had only one routine check-up also came from the middle class, showing that this class was least insistent on monitoring the health of its children.

An alarming 92.65% of the infants did not have a medical aid cover, consisting of 50.79% males and 49.21% females. 86.08% of infants without a medical aid cover were of African descent and these constituted 95.26% of all African infants. It also shows that 87.8% of colored infants did not have medical

cover and that the medical cover amongst whites was 59.52%. Tribal authority settlements had 52.52% of infants without medical aid cover. KwaZulu-Natal province had 32.84% of infants who were not on medical aid cover. 99.1% of infants from low income households had no medical aid cover

3.2 Anthropometric measures analysis on the infants



The graph above shows that most infants had birth weights in the range 2 – 4kg, which is generally healthy.

The mean height of the infants was 90.83cm and the median height was 92.5cm. The median weight of the infants was 14.3kg whilst their mean weight was 15.28kg. The mean head circumference at birth of the infants was 34.6cm whilst the median was 34.5cm. The range of the head circumference was 56.6cm. The mean waist circumference of the infants was 51.71cm and the median waist circumference was 52.5cm.

Hypothesis tests were carried out on the anthropometric measures in terms of the differentials gender, place of residence, race, province and economic class to assess their influence. T-tests and ANOVA tests were carried out and the following results were obtained.

The birth weights of male and female infants were insignificantly different from each other (*p-value= 0.3041*). The gender difference in mean height was statistically insignificant from each other (*p-value=0.9310*). The mean weight difference of the infants by gender was statistically insignificant, since the p-value was 0.5533. The difference of the mean head circumference at birth of the infants by gender was statistically insignificant (p-*value= 0.5213*). The difference of the mean waist circumferences of the

infants by gender was statistically insignificant, since the p-value was 0.9689. The difference in the mean body mass index of the infants by gender was statistically significant, since the p-value was 0.0003.

The following results were obtained from the Analysis of Variance (ANOVA) of the impact of the differentials with at least three groupings on the other anthropometric measures.

Race had no statistically significant influence on the average birth weight of the infants since the p-value was 0.7694. Place of residence/settlement did not influence the mean birth weight of the infants significantly since it had a p-value of 0.3584. Province influenced the mean birth weight of the infants significantly since their p-value was 0.0001. The economic class did not significantly influence the mean birth weight of the infants as evidenced by the p-value of 0.2806. We failed to reject the null hypothesis of equality of influence of race on the mean height of the infants since the p-value was 0.5484. Settlement's influence on the mean height of the infants was statistically insignificant since the p-value was 0.9415 which exceeded the significance level, α=0.05. We rejected the null hypothesis of equality of influence of province on the mean height of the infants since the p-value was 0.0013. We failed to reject the null hypothesis of equality of influence of economic class (*p-value= 0.2159*), race (*p-value=0.2184*), place of residence (*p-value=0.47*), and economic class (*p-value=0.374*), on the mean height of the infants. We rejected the null hypothesis of equality of influence of province on the mean weight of the infants since its p-value was 0.0039. This shows that the mean weight of infants is determined by their province of residence. We rejected the null hypothesis of equality of influence of race on the mean head circumference at birth of the infants since it had a p-value of 0.0001. This meant that the mean head circumference at birth of infants in South Africa was highly influenced by race, with white infants having the largest and Asian Indians have the least. We fail to reject the null hypothesis of equality of influence of place of residence/settlement (*p-value=0.8456*), economic class (*p-value=0.1839*) on the mean head circumference at birth of the infants. We rejected the null hypothesis of equality of influence of the treatment province on the mean head circumference at birth of the infants since the p-value was less than 0.0001. It was noted that the infants from Limpopo, Northern Cape and Western Cape provinces had mean head circumferences less that the whole country's mean. The null hypotheses of equality of influence of the factors race (*p-value=0.0683*), place of residence/settlement (*p-value=0.5327*), and economic class (*p-value=0.0523*) on the mean waist circumference at birth of the infants were not rejected. However, we rejected the null hypothesis of equality of influence of the factor province on the mean waist circumference at birth of the infants since the p-value was 0.003. The infants from North West province had the largest mean circumference whilst those from the Northern Cape had the least mean circumference.

The ANOVA table for the factors race (*0.0948*), place of residence/settlement (*p-value=0.2567*), and economic class (*p-value=0.3664*) showed that they had statistically insignificant influence on the mean body mass index. Using ANOVA, we rejected the null hypothesis of equality of influence of the differential province on the mean body mass index of the infants under investigation since the p-value was less than 0.0001. The Eastern Cape and Gauteng provinces had infants with the largest BMIs whilst Limpopo province had the least mean BMI for the infants.

4. CONCLUSIONS AND RECOMMENDATIONS

The findings above intuitively shows that the differentials gender, race, settlement, province and economic class had some influence on the general access to health facilities as well as on the anthropometric measures of South African infants.

The majority of the infants in South Africa have formidable access to health facilities, with glaring inaccessibility to medical aid cover and routine medical check-ups across all the differentials. In instances of inaccessibility on all variables of concerns, the following groups were more prolific, Africans, tribal authority settlers, the middle class family infants, and those from KwaZulu-Natal province.

We recommend that the government of South Africa must avail medical aid facilities for the working middle class within their income capability and encourage them to take them. They should channel more health resources within tribal authority settlements. The Africans and the general population of KwaZulu-Natal province should be educated on the importance of health access in their lives and in particular for their infants.

There were no significant differences on the anthropometric measures due to the all other differentials except for that on BMI due to gender, head circumference at birth due to race and province which significantly influenced all the measures observed.

Overall the health initiatives currently in South Africa are commendable, and the health levels of its population are high. However, with the progression of HIV/AIDS we recommend that interventions be put in place to curb poverty especially amongst the middle class as well as within tribal authority settlements and in KwaZulu-Natal province to avert disasters in the future.

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