

**Using Demographic and Health Survey (DHS) data to describe intra country
inequities in health status:**

Zimbabwe

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Background:

Improving equity in health is a goal for many countries, for wide disparities in health of different social groups based in privilege is considered to be undesirable and socially unjust. The monitoring of equity is an important activity in the furtherance of this goal. There is however, a need for tools that are valid and relatively easy to use and process, to be able to monitor equity, to provide appropriate information for policy makers and practitioners. Existing data sources could provide useful information for monitoring purposes. One such data source are the Demographic and Health Surveys.

Demographic and Health Surveys (DHS) have been carried out in a number of countries, in many instances more than once. DHS surveys have been carried out in Zimbabwe in 1988, 1994 and 1998. Whilst the Demographic and Health Surveys are primarily concerned with gathering data on fertility and contraception, they also collect data on health status and on some indicators of socioeconomic status. For many countries, these surveys are often the definitive sources of information on demographic, contraception, fertility and health status trends and issues. This indicates a recognition that the data generated by these surveys is of good quality and sufficiently valid to inform policy and practice, particularly in the area of family planning and reproductive health. Through a reanalysis of the DHS data, the potential exists to be able to examine indicators of health status and reported health seeking behaviour by gender, and by different socioeconomic and ethnic groups, at national and at provincial/regional level within countries. As there are often DHS data available at different time points, (the surveys are usually carried out at intervals of five to seven years), the possibility exists for the exploration of trends in health status and health care services in relation to indicators of equity. In so doing, tools could be developed to allow for a description of equity issues, and the generation of hypotheses of how policies and practices might affect equity.

Objectives:

General objective:

To assess the extent to which the Demographic and Health Survey data can be used to monitor equity in health status and utilization in Zimbabwe.

Specific objectives:

- 1.To describe how the health status and utilization of health service varies according to socioeconomic status and where appropriate, gender and ethnic group
- 2.To describe how these variations change over time
- 3.To make suggestions on the use of DHS data to monitor equity in health status and utilization.

Methodology:

Two methods were used to identify and categorise socioeconomic groups from the DHS data files. These were the principal component analysis and factor analysis. Both methods examine the relationships among a set of variables without identifying a specific response variable. Both techniques depend upon the covariances, or the correlations, between the variables. The principal component analysis is a technique for explaining as much variability as possible in terms of a few linear combinations of the variables. Factor analysis attempts to explain the relationship among the variables. The model assumes that the relationship may be explained by a few unobserved variables that are termed factors. It is hoped that fewer factors than the original number of variables will be needed to explain the relationship among the variables.

Principal component analysis and factor analysis have become well established methods in creating socioeconomic groupings from the assets, flooring material and elements of feeding practices recorded in the DHS.

The principal component that explains the most variation is consequently selected for the analysis. In this report, this component was then used to categorise respondents into quintiles, representing degrees of "wealth".

The outcome variables available in the DHS data sets have been grouped into three categories of health status, health care services and other major determinants of health status. These include the following:

1. Health status:

- women's body mass index (BMI)
- low height-for-age (stunting)
- low weight-for-age (underweight)
- low weight-for-height (wasting)
- low birth weight
- recent diarrhoea (last 2 weeks)

2. Health care services/practices

- birth spacing: interval since last birth < 24 months versus >25 months
- parity: % of women with parity 5
- delivered in a health-care facility
- child fully immunized for age

3. Other major health determinants

- the woman's education:
- type of water supply:
- toilet facility:

Findings:

Table 1: Total variance explained, 1994 DHS

| Component | Initial Eigenvalues | | |
|-----------|---------------------|---------------|--------------|
| | Total | % of variance | Cumulative % |
| 1 | 5.986 | 54.408 | 54.408 |
| 2 | 2.862 | 26.023 | 80.431 |
| 3 | 0.773 | 7.023 | 87.454 |
| 4 | 0.489 | 4.449 | 91.902 |
| 5 | 0.269 | 2.442 | 94.344 |
| 6 | 0.234 | 2.129 | 96.474 |
| 7 | 0.137 | 1.249 | 97.722 |
| 8 | 0.07997 | 0.727 | 98.449 |
| 9 | 0.06617 | 0.602 | 99.051 |
| 10 | 0.06034 | 0.549 | 99.599 |
| 11 | 0.04407 | 0.401 | 100.00 |

Table 1 presents the variance explained by the components for the 1994 DHS. Component 1 explained 54% of the variance.

Table 2: Wealth score from factor analysis, 1994 DHS

| | | Quintile | | | | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | 1 | 2 | 3 | 4 | 5 |
| Has radio | No | 462 (38.7%) | 352 (29.5%) | 220 (18.4%) | 122 (10.2%) | 38 (3.2%) |
| | Yes | 0 | 118 (13%) | 138 (15.1%) | 300 (32.9%) | 355 (39%) |
| Has television | No | 462 (25.1%) | 470 (25.6%) | 354 (19.2%) | 388 (21.1%) | 165 (9%) |
| | Yes | 0 | 0 | 4 (1.5%) | 34 (12.8%) | 228 (85.7%) |
| Has fridge | No | 462 (23.5%) | 470 (23.9%) | 356 (18.1%) | 421 (21.4%) | 259 (13.2%) |
| | Yes | 0 | 0 | 2 (1.5%) | 1 (0.7%) | 134 (97.8%) |
| Has bicycle | No | 462 (22%) | 470 (28.1%) | 291 (17.4%) | 265 (15.8%) | 185 (11.1%) |
| | Yes | 0 | 0 | 67 (15.4%) | 157 (36.2%) | 210 (48.4%) |
| Has motorcycle | No | 462 (22.9%) | 470 (22.4%) | 358 (17.1%) | 422 (20.1%) | 385 (18.4%) |
| | Yes | 0 | 0 | 0 | 0 | 10 (100%) |
| Has car | No | 462 (22.9%) | 470 (23.3%) | 358 (17.7%) | 418 (20.7%) | 313 (15.5%) |
| | Yes | 0 | 0 | 0 | 4 (4.7%) | 82 (95.3%) |
| Main floor material | Natural | 462 (42%) | 276 (25.1%) | 197 (17.9%) | 124 (11.3%) | 42 (3.8%) |
| | Rudimentary | 0 | 0 | 1 (20%) | 0 | 4 (80%) |
| | Finished | 0 | 194 (19.4%) | 160 (16%) | 298 (29.8%) | 349 (34.8%) |
| Gave child Juice | No | 462 (28.2%) | 400 (24.4%) | 258 (15.8%) | 298 (18.2%) | 218 (13.3%) |
| | Yes | 0 | 48 (12.6%) | 76 (19.9%) | 100 (26.2%) | 157 (41.2%) |
| Gave child powdered /tinned milk | No | 462 (23.8%) | 430 (22.1%) | 321 (16.5%) | 381 (19.6%) | 350 (18%) |
| | Yes | 0 | 18 (26.9%) | 14 (20.9%) | 13 (19.4%) | 22 (32.8%) |
| Gave child fresh milk | No | 462 (30.6%) | 297 (19.7%) | 257 (17%) | 273 (18.1%) | 221 (14.6%) |
| | Yes | 0 | 150 (29.6%) | 78 (15.4%) | 124 (24.5%) | 154 (30.4%) |
| Has modern Ox-cart | No | 462 (26.9%) | 470 (27.4%) | 268 (15.6%) | 267 (15.6%) | 250 (14.6%) |
| | Yes | 0 | 0 | 90 (23.1%) | 155 (39.7%) | 145 (37.2%) |

From the table, in the first quintile (the poorest 20% of the interviewees) had no possessions and gave their children no other juice, powdered milk nor fresh milk. The percentages of people who had no assets decrease as one moves over to the last quintile (the richest 20% of the interviewees). The SES index appeared to work well in differentiating between groups based on the assets and use of selected food items.

The SES index was examined by respondents' residence (rural or urban), Table 3.

Table 3: Place of residence by wealth score, 1994 DHS

| | Quintile | | | | | |
|------------------------------|----------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Radio Count | 0 | 2 | 37 | 80 | 199 | 318 |
| % that has radio | | 0.6% | 11.6% | 25.2% | 62.6% | 40.1% |
| RURAL Count | 0 | 116 | 101 | 220 | 156 | 593 |
| % that has radio | | 19.6% | 17% | 37.1% | 26.3% | 36.4% |
| Television Count | 0 | 0 | 1 | 27 | 175 | 203 |
| % that has TV | | | 0.5% | 13.3% | 86.2% | 42.6% |
| RURAL Count | 0 | 0 | 3 | 7 | 53 | 63 |
| % that has TV | | | 4.8% | 11.1% | 84.1% | 3.9% |
| Refrigerator Count | 0 | 0 | 2 | 1 | 110 | 113 |
| % that has fridge | | | 1.8% | 0.9% | 97.3% | 23.7% |
| RURAL Count | 0 | 0 | 0 | 0 | 24 | 24 |
| % that has fridge | | | | | 100% | 1.5% |
| Bicycle Count | 0 | 0 | 1 | 22 | 72 | 95 |
| % that has bicycle | | | 1.1% | 23.2% | 75.8% | 19.9% |
| RURAL Count | 0 | 0 | 66 | 135 | 138 | 339 |
| % that has bicycle | | | 19.5% | 39.8% | 40.7% | 20.8% |
| Motorcycle Count | 0 | 0 | 0 | 0 | 5 | 5 |
| % that has motorcycle | | | | | 100% | 1% |
| RURAL Count | 0 | 0 | 0 | 0 | 5 | 5 |
| % that has motorcycle | | | | | 100% | 0.3% |
| Car Count | 0 | 0 | 0 | 2 | 58 | 60 |
| % that has car | | | | 3.3% | 96.7% | 12.6% |
| RURAL Count | 0 | 0 | 0 | 2 | 24 | 26 |
| % that has car | | | | 7.7% | 92.3% | 1.6% |
| Main floor material Count | 11 | 8 | 4 | 1 | 2 | 26 |
| % that has natural floor | 42.3% | 30.8% | 15.4% | 3.8% | 7.7% | 5.5% |
| Count | 0 | 0 | 1 | 0 | 4 | 5 |
| % that has rudimentary floor | | | 20% | | 80% | 1% |
| Count | 0 | 72 | 64 | 103 | 207 | 446 |
| % that has finished floor | | 16.1% | 14.3% | 23.1% | 46.4% | 93.5% |
| RURAL Count | 451 | 268 | 193 | 123 | 40 | 1075 |
| % that has natural floor | 42% | 24.9% | 18% | 11.4% | 3.7% | 66% |
| Count | 0 | 122 | 96 | 195 | 142 | 555 |
| % that has finished floor | | 22% | 17.3% | 35.1% | 25.6% | 34% |
| Gave child juice Count | 0 | 2 | 30 | 39 | 108 | 179 |
| % that gave child juice | | 1.1% | 16.8% | 21.8% | 60.3% | 39.4% |
| RURAL Count | 0 | 46 | 46 | 61 | 49 | 202 |
| % that gave child juice | | 22.8% | 22.8% | 30.2% | 24.3% | 12.9% |
| Powdered milk Count | 0 | 1 | 4 | 8 | 14 | 27 |
| % that gave powdered milk | | 3.7% | 14.8% | 29.6% | 51.9% | 6% |
| RURAL Count | 0 | 17 | 10 | 5 | 8 | 40 |
| % that gave powdered milk | | 42.5% | 25% | 12.5% | 20% | 2.6% |
| Fresh milk Count | 0 | 32 | 15 | 36 | 94 | 177 |
| % that gave fresh milk | | 18.1% | 8.5% | 20.3% | 53.1% | 39% |
| RURAL Count | 0 | 118 | 63 | 88 | 60 | 329 |
| % that gave fresh milk | | 35.9% | 19.1% | 26.7% | 18.2% | 21.1% |
| Modern ox-cart Count | 0 | 0 | 2 | 8 | 16 | 26 |
| % that has a modern ox-cart | | | 7.7% | 30.8% | 61.5% | 5.5% |
| RURAL Count | 0 | 0 | 88 | 147 | 129 | 364 |
| % that has modern ox-cart | | | 24.2% | 40.4% | 35.4% | 22.3% |

Larger percentages of the rural population had no assets in the first quintiles as compared to the urban population. The urban population appeared to be better off than the rural population. For example, of the rural population who had no radio about 43.5% were in the first quintile while only 7% of the urban dwellers were in the first quintile. Generally there was an inverse association of assets with quintile of SES, for both types of residence, though percentages in the urban areas were higher. For modern ox-cart : Of those in the fifth quintile who where in the urban area only 7.5% had a modern ox-cart while of those who were in the fifth quintile who where in the rural area about 70.0% had a modern ox-cart.

The factor analysis for the 1988 DHS data was undertaken in a similar way to that for the 1994 data. These findings are presented in Tables 4-. For 1988, component 1 explained 34% of the variance.

Table 4: Total Variance Explained, 1988 DHS

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.694 | 33.674 | 33.674 | 2.694 | 33.674 | 33.674 |
| 2 | 1.219 | 15.233 | 48.907 | 1.219 | 15.233 | 48.907 |
| 3 | 0.986 | 12.327 | 61.234 | | | |
| 4 | 0.821 | 10.260 | 71.494 | | | |
| 5 | 0.750 | 9.370 | 80.864 | | | |
| 6 | 0.681 | 8.511 | 89.375 | | | |
| 7 | 0.589 | 7.361 | 96.737 | | | |
| 8 | 0.261 | 3.263 | 100.00 | | | |

Table 5: Wealth score from factor analysis, 1988DHS.

| | Quintile | | | | | | |
|---------------------|------------------------------|-------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | Total | |
| Radio | Count | 2 | 74 | 58 | 721 | 501 | 1356 |
| | % that has radio | 0.1% | 5.5% | 4.3% | 53.2% | 36.9% | 40.4% |
| Television | Count | | | | | 322 | 322 |
| | % that has TV | | | | | 100% | 9.6% |
| Refrigerator | Count | 2 | | | | 349 | 351 |
| | % that has fridge | 0.6% | | | | 99.4% | 10.5% |
| Bicycle | Count | 153 | 215 | 8 | 273 | 142 | 791 |
| | % that has bicycle | 19.3% | 27.2% | 1.0% | 34.5% | 18.0% | 23.6% |
| Motorcycle | Count | 8 | 5 | 4 | 4 | 14 | 35 |
| | % that has motorcycle | 22.9% | 14.3% | 11.4% | 11.4% | 40.0% | 1% |
| Car | Count | | 8 | 6 | 26 | 208 | 248 |
| | % that has car | | 3.2% | 2.4% | 10.5% | 83.9% | 7.4% |
| Main floor material | Count | 598 | 74 | 54 | 9 | 0 | 735 |
| | % that has natural floor | 88.9% | 7.8% | 7.7% | 1.1% | | 22.1% |
| | Count | 67 | 464 | 6 | 153 | 2 | 692 |
| | % that has rudimentary floor | 10% | 66.9% | 0.9% | 20.6% | 0.4% | 20.8% |
| | Count | 8 | 156 | 641 | 579 | 513 | 1897 |
| | % that has finished floor | 1.1% | 25.3% | 91.4% | 78.3% | 99.6% | 57.1% |
| Scotch cart | Count | 584 | 521 | 587 | 616 | 443 | 2751 |
| | % that has scotch cart | 21.2% | 18.9% | 21.3% | 22.4% | 16.1% | 82% |

The quintiles of SES appeared to differentiate the groups reasonably well, with the prevalence of assets. Those in the lower quintiles had less assets compared to those in the higher quintiles of SES. For example, no one in quintile 1 had a car, and only 2 had a refrigerator. The only respondents who had televisions were those in SES 5.

HEALTH STATUS

An indicator of health status, body mass index of the respondents, in relation to socioeconomic status, is presented in Table 6. This information is only for 1994, as these data were not collected in the 1988 DHS.

Table 6: SES by quintile of body mass index (BMI); 1994 DHS

| Quintile | BODY MASS INDEX | | | | |
|--------------------------|-----------------|---------------|----------------|---------------|--------|
| | <= 20.21 | 20.21 - 21.74 | 21.74 - 23.224 | 23.22 - 25.56 | >25.56 |
| 1 | 126 | 103 | 91 | 96 | 42 |
| column % | 29.2% | 24.2% | 21.8% | 23.1% | 10.9% |
| % within first quintile | 27.5% | 22.5% | 19.9% | 21% | 9.1% |
| 2 | 93 | 105 | 113 | 84 | 64 |
| column % | 21.6% | 24.6% | 27% | 20.2% | 16.6% |
| % within second quintile | 20.3% | 22.9% | 24.6% | 18.3% | 13.9% |
| 3 | 71 | 80 | 68 | 65 | 66 |
| column % | 16.5% | 18.8% | 16.3% | 15.7% | 17.1% |
| % within third quintile | 20.3% | 22.9% | 19.4% | 18.6% | 18.9% |
| 4 | 84 | 76 | 87 | 92 | 74 |
| column % | 19.5% | 17.8% | 20.8% | 22.2% | 19.2% |
| % within fourth quintile | 20.3% | 18.4% | 21.1% | 22.3% | 17.9% |
| 5 | 57 | 62 | 59 | 78 | 139 |
| column % | 13.2% | 14.6% | 14.1% | 18.8% | 36.1% |
| % within last quintile | 14.4% | 15.7% | 15% | 19.7% | 35.2% |
| Poor/Rich ratio | 2.21 | 1.66 | 1.54 | 1.23 | 0.30 |

There appears to be a relationship between BMI and SES. Nearly 30% of respondents in the first quintile of SES had a low BMI (<20.2), while only 14% of those in the highest SES quintile had this low a BMI. From the poor/rich ratio the number of individuals in the 1st quintile with a low BMI is about 2.2 times more than in the 5th quintile. On the other hand, only about 10% of those in the first quintile had a high BMI (>25.5), compared to 35% of those in the highest quintile of SES. This is evidenced by the very low poor/rich ratio. The prevalence odds ratio (POR) comparing women in the lowest quintile with those in the highest quintile among the women with a BMI <20.2 was 2.25. Women in this stratum of BMI were 2.25 times more likely to be of the lowest SES compared to women in the highest SES.

Table 7: Quintiles of SES by height for age (stunting); 1994 and 1988: below -2 SD

| SES | 1994 (n=1930) | | 1988 (n=2451) | |
|-----------------|---------------|------|---------------|-------|
| | 1994 | 1988 | N | % |
| 1 | 439 | 517 | 117 | 27.7 |
| | | | | 6.1 |
| 2 | 424 | 524 | 104 | 24.5 |
| | | | | 5.4 |
| 3 | 325 | 499 | 74 | 17.5 |
| | | | | 3.8 |
| 4 | 378 | 534 | 70 | 16.5 |
| | | | | 3.6 |
| 5 | 364 | 377 | 58 | 13.7 |
| | | | | 3.0 |
| Total | 1930 | 2451 | 423 | 100.0 |
| Poor/rich ratio | | | | 2.02 |
| POR | | | | 1.92 |

Table 7 shows the expected trend of declining prevalence of stunting by quintile of socio-economic status (SES) for both the years of the survey. A comparison of the trend of proportions of low height-for-age by SES between the two survey periods shows that except for the highest quintile of SES, there was no change. The percentage of children below $-2SD$ of height for age in this quintile increased from 1.6% in 1988 to 3.0% in 1994, even though the overall proportion of stunting decreased from 30.8% to 21.9%. In 1988 the percentage of interviewees in the 1st quintile was 4 times more than in the 5th quintile. In 1994 the poor/rich ratio decreased to 2.

Table 8: Quintiles of SES by weight for age (underweight); 1994 and 1988: below -2 SD

| SES | 1994 (n=1930) | | | | 1988 (n=2451) | |
|-----------------|---------------|------|------|-------------|---------------|-------------|
| | 1994 | 1988 | N | % | N | % |
| 1 | 439 | 517 | 68 | 26.7 3.5 | 83 | 29.2 2.5 |
| 2 | 424 | 524 | 64 | 25.1 3.3 | 86 | 30.1 2.6 |
| 3 | 325 | 499 | 52 | 20.4 2.7 | 46 | 16.1 1.4 |
| 4 | 378 | 534 | 35 | 13.7 1.8 | 51 | 17.9 1.5 |
| 5 | 364 | 377 | 36 | 14.1 1.9 | 19 | 6.7 0.6 |
| Total | 1930 | 2451 | 255 | 100.0 | 285 | 100.0 |
| Poor/rich ratio | | | 1.89 | | 4.37 | |
| POR | | | 1.55 | | 3.60 | |

Overall there was a marginal increase (11.6% in 1988 to 13.2%, 1994) in the percentage of children undernourished. An increase in the proportion malnourished comparing 1988 with 1994 findings was exhibited in all the quintiles of SES. There was also a clear trend of increasing malnutrition by decreasing SES. The relative risk was much higher in 1988 than in 1994. In 1988, being in the lowest socio-economic quintile increased the risk of children below 3 years of age to be underweight by about 3 times compared with children in the highest (fifth) socio-economic quintile. The relative risk dropped down to 1.6 (about half of the 1988 ratio) in 1994.

Table 9: Quintiles of SES by weight for height (wasting); 1994 and 1988: below -2 SD

| SES | 1994 (n=1930) | | | | 1988 (n=2453) | |
|-----------------|---------------|------|------|-------------|---------------|-------------|
| | 1994 | 1988 | N | % | N | % |
| 1 | 439 | 517 | 30 | 27.0 1.6 | 4 | 12.9 0.1 |
| 2 | 424 | 524 | 30 | 27.0 1.6 | 14 | 45.2 0.4 |
| 3 | 325 | 501 | 22 | 19.8 1.1 | 4 | 12.9 0.1 |
| 4 | 378 | 534 | 12 | 10.9 0.6 | 6 | 19.4 0.2 |
| 5 | 364 | 377 | 17 | 15.3 0.9 | 3 | 9.7 0.09 |
| Total | 1930 | 2453 | 81 | 100.0 | 31 | 100.0 |
| Poor/rich ratio | | | 1.76 | | 1.33 | |
| POR | | | 1.50 | | 0.97 | |

The trend of increasing prevalence of wasting by decreasing quintile of SES is shown in the 1994 data, (Table 9). There is however, no clear trend in the 1988 data, as 45% of the wasting children were in SES 2. Overall there was an increase in the proportion of wasting children, from 1.3% in 1988 to 4.2% in 1994. The increasing prevalence of wasted children affected all the quintiles of SES. However, using the POR, the gap in wasting children increased by 50% between those in the lowest SES quintile compared to those in the highest quintile.

Table 10: Quintiles of SES by reported occurrence of diarrhoea in the past 2 weeks.

| SES | 1994 (n=2054) | | | | 1988 (n=2929) | |
|-----------------|---------------|------|------|--------------|---------------|--------------|
| | 1994 | 1988 | N | % | N | % |
| 1 | 462 | 604 | 135 | 26.9 29.2 | 124 | 19.9 20.5 |
| 2 | 457 | 622 | 107 | 21.3 23.4 | 141 | 22.6 22.7 |
| 3 | 341 | 592 | 89 | 17.7 26.1 | 145 | 23.3 24.5 |
| 4 | 406 | 650 | 83 | 16.5 20.4 | 148 | 23.8 22.8 |
| 5 | 388 | 461 | 88 | 17.5 22.7 | 65 | 10.4 14.1 |
| Total | 2054 | 2929 | 502 | 100.0 | 623 | 100.0 |
| Poor/rich ratio | | | 1.53 | | 1.91 | |
| Relative risk | | | 1.41 | | 1.57 | |

There was a slight increase overall in the reported prevalence of diarrhoea between the two survey periods, 21.3% to 24.4%. There was an increase in the prevalence of diarrhoea among both the lowest and the highest quintile of SES, comparing the two survey periods.

Table 11: Quintiles of SES by birth weight <2500 g: 1994 and 1988.

| SES | 1994 (n=1434) | | 1988 (n=1448) | | N | % |
|-----------------|---------------|------|---------------|-------|------|-------|
| | 1994 | 1988 | N | % | | |
| 1 | 235 | 242 | 40 | 15.9 | 28 | 17.4 |
| | | | | 17.0 | | 11.6 |
| 2 | 305 | 256 | 59 | 23.4 | 32 | 19.9 |
| | | | | 19.3 | | 12.5 |
| 3 | 240 | 295 | 49 | 19.4 | 23 | 14.3 |
| | | | | 20.4 | | 7.8 |
| 4 | 321 | 354 | 55 | 21.8 | 49 | 30.4 |
| | | | | 17.1 | | 13.8 |
| 5 | 333 | 301 | 49 | 19.4 | 29 | 18.0 |
| | | | | 14.7 | | 9.6 |
| Total | 1434 | 1448 | 252 | 100.0 | 161 | 100.0 |
| Poor/rich ratio | | | 0.82 | | 0.97 | |
| Relative risk | | | 1.19 | | 1.23 | |

Overall, there was an increase in the proportion of low birth weight babies born in health institutions, 11.1% in 1988 compared to 17.6% in 1994. There was only a 2-3% difference in the percentage of low birth weight babies between the highest and the lowest quintiles of SES. For the 2 years there was not much difference in the poor/rich ratios. The percentage of interviewees in the 1st quintile was almost the same as that in the highest quintile in 1988.

Health Care Services/Practices:

Indicators used for health care services/practices included the percentage of children fully immunized for age, parity, (percentage of women with a parity of 5 or more versus less), and delivery in a health care facility. Table 12 presents quintiles of SES by immunization status.

Table 12: Quintiles of SES by immunization status of children 1994 and 1988.
Percentage fully immunized.

| SES | N | | 1994 (n=2116) | | 1988 (n=2299) | |
|-----------------|------|------|---------------|-------|---------------|-------|
| | 1994 | 1988 | N | % | N | % |
| 1 | 462 | 487 | 348 | 20.7 | 378 | 19.7 |
| | | | | 75.3 | | 77.6 |
| 2 | 470 | 475 | 366 | 21.8 | 384 | 20.0 |
| | | | | 77.9 | | 80.8 |
| 3 | 358 | 451 | 283 | 16.8 | 371 | 19.3 |
| | | | | 79.0 | | 82.3 |
| 4 | 422 | 533 | 344 | 20.5 | 453 | 23.6 |
| | | | | 81.5 | | 84.9 |
| 5 | 404 | 353 | 341 | 20.3 | 332 | 17.3 |
| | | | | 84.4 | | 94.0 |
| Total | 2116 | 2299 | 1682 | 100.0 | 1918 | 100.0 |
| Poor/rich ratio | | | 1.02 | | 1.14 | |
| Relative risk | | | 0.56 | | 0.22 | |

The overall percentage of children fully immunized recorded a marginal decline, from 83.4% in 1988 to 79.5% in 1994, with the largest decline of 10% among children in the highest SES quintile. In 1994, the percentage of children fully immunized in the highest quintile of SES was about 10% greater than that in the lowest quintile.

Table 13: Quintiles of SES by place of delivery 1994 (n=2107) and 1988(n=3317)

| SES | N | | Home | | | | Private sector | | | |
|-----------------|------|------|------|--------------|------|--------------|----------------|-------------|------|--------------|
| | 1994 | 1988 | 1994 | | 1988 | | 1994 | | 1988 | |
| | | | N | % | N | % | N | % | N | % |
| 1 | 460 | 668 | 212 | 31.9 46.1 | 298 | 30.7 44.6 | 6 | 10.7 1.3 | 69 | 16.4 10.3 |
| 2 | 469 | 682 | 167 | 25.1 35.6 | 273 | 28.1 40.0 | 5 | 8.9 1.1 | 76 | 18.1 11.1 |
| 3 | 354 | 696 | 109 | 16.4 30.8 | 170 | 17.5 24.4 | 10 | 17.9 2.8 | 79 | 18.8 11.3 |
| 4 | 420 | 734 | 110 | 16.5 26.2 | 183 | 18.8 24.9 | 6 | 10.7 1.4 | 109 | 25.9 14.8 |
| 5 | 404 | 537 | 67 | 10.1 16.6 | 48 | 4.9 8.9 | 29 | 51.8 7.2 | 88 | 20.9 16.3 |
| Total | 2107 | 3317 | 665 | 100.0 | 972 | 100.0 | 56 | 100.0 | 421 | 100.0 |
| Poor/rich ratio | | | 3.16 | | 6.21 | | 0.21 | | 0.78 | |
| POR | | | 4.30 | | 8.20 | | 0.17 | | 0.59 | |

The relationship of place of delivery 1994 and 1988, by quintiles of SES, (Table 13), showed that overall the proportion of home deliveries showed little change, being 30%. However, the percentage of home deliveries among the highest quintile of SES increased by 8% from 1988 to 1994. The proportion of deliveries in the private sector had decreased dramatically from about 13% in 1988 to 3% in 1994, with all the SES groupings reduced their use of the private sector, with even the proportion in the highest quintile being reduced by half. For home deliveries, the poor/rich ratios were very high for both years, while they were low for private sector deliveries. The relative risk in (1988) of delivering in a home was increased by 8 times for the interviewees in the lowest SE class as compared to those in the highest SE class. Although the odds ratio dropped in 1994 to about 4.30 it was still fairly high.

Table 14: Quintiles of SES by parity 1994 and 1988.
Number and percentage of women with parity 5 or more.

| SES | N | | 1994 (n=2117) | | 1988 (n=3358) | |
|-----------------|------|------|---------------|--------------|---------------|--------------|
| | 1994 | 1988 | N | % | N | % |
| 1 | 462 | 676 | 191 | 30.7 41.3 | 341 | 25.5 50.4 |
| 2 | 470 | 695 | 140 | 22.5 29.8 | 319 | 23.9 45.9 |
| 3 | 358 | 701 | 102 | 16.4 28.5 | 278 | 20.8 39.7 |
| 4 | 422 | 741 | 100 | 16.1 23.7 | 239 | 17.9 32.3 |
| 5 | 405 | 545 | 90 | 14.4 22.2 | 159 | 11.9 29.2 |
| Total | 2117 | 3358 | 623 | 100.0 | 1336 | 100.0 |
| Poor/rich ratio | | | 2.12 | | 2.145 | |
| POR | | | 2.47 | | 2.47 | |

Table 14 presents parity (5 or more) by socioeconomic status for 1994 and 1988. Overall, there was a 10% decline in the proportion of women with a parity of at least 5 between 1988 and 1994. The largest percentage decline of 16% was among women in SES 2. Though women in SES 1 also exhibited an appreciable decline in parity (9%), they still had proportionately greater women of higher parity than women in any of the other quintiles.

OTHER MAJOR HEALTH DETERMINANTS:

The variables selected for other major health determinants were the woman's education, type of water supply and toilet facility. Table 15 presents the woman's education level by quintiles of SES.

Table 15: Quintiles of SES by education level of (female) respondent, 1994 (n=2117) and 1988 (n=3358).

| SES | N | | No education | | 1988 | | Secondary education and above | | 1988 | |
|-----------------|------|------|--------------|--------------|------|--------------|-------------------------------|--------------|--------|--------------|
| | 1994 | 1988 | N | % | N | % | N | % | N | % |
| 1 | 462 | 676 | 126 | 47.5 27.3 | 208 | 33.5 30.8 | 66 | 8.6 14.3 | 28 | 4.4 4.1 |
| 2 | 470 | 695 | 49 | 18.5 10.4 | 174 | 28.0 25.0 | 140 | 18.3 29.8 | 56 | 8.8 8.0 |
| 3 | 358 | 701 | 41 | 15.5 11.5 | 112 | 18.0 15.9 | 118 | 15.4 32.9 | 110 | 17.4 15.7 |
| 4 | 422 | 741 | 36 | 13.6 8.5 | 101 | 16.3 13.6 | 187 | 24.4 44.3 | 158 | 24.9 21.3 |
| 5 | 405 | 545 | 13 | 4.9 3.2 | 26 | 4.2 4.8 | 256 | 33.4 63.2 | 291 | 44.4 53.4 |
| Total | 2117 | 3358 | 265 | 100.0 | 621 | 100.0 | 767 | 100.0 | 643 | 100.0 |
| Poor/rich ratio | | | 9.69 | | 8.00 | | 0.258 | | 0.0962 | |
| POR | | | 11.3 | | 8.87 | | 0.097 | | 0.04 | |

There was a decrease in the proportion of women with no education from 18% in 1988 to 13% in 1994, with SES groups 2 and 4 registered the largest decreases. The poor/rich ratios were very high for the no education category whilst they were low ratios for secondary and above education level. In 1994, there were about 9.7 times more people with no education in the 1st quintile than in the last quintile and about 8 times more in 1988. On the other hand, the overall proportion of women with secondary education and above in this group increased from 4% to 9%, with the largest proportional increases in the lower SES groupings. The high relative risks for no education meant that being in the first SES increased the risk of having no education by 11.3 times in 1994 and 8.9 times in 1988 compared with being in the highest quintile.

Table 16: Quintiles of SES by source of drinking water, 1994 (n=1632) and 1988 (n=2464).
(Rural respondents)

| SES | N | | Piped water | | 1988 | | Well water | | 1988 | |
|-----------------|------|------|-------------|--------------|------|--------------|------------|--------------|------|--------------|
| | 1994 | 1988 | N | % | N | % | N | % | N | % |
| 1 | 449 | 669 | 49 | 21.0 10.9 | 60 | 12.6 8.9 | 296 | 26.4 65.9 | 441 | 28.2 65.9 |
| 2 | 390 | 663 | 58 | 24.9 14.9 | 129 | 27.0 19.5 | 276 | 24.6 70.8 | 434 | 27.7 65.4 |
| 3 | 288 | 502 | 44 | 18.9 15.3 | 113 | 23.6 22.5 | 197 | 17.6 68.4 | 320 | 20.4 63.7 |
| 4 | 318 | 476 | 51 | 21.9 16.0 | 127 | 26.6 26.7 | 219 | 19.6 68.8 | 281 | 17.9 59.0 |
| 5 | 187 | 154 | 31 | 13.3 16.6 | 49 | 10.3 31.8 | 132 | 11.8 70.6 | 90 | 5.7 58.4 |
| Total | 1632 | 2464 | 233 | 100.0 | 478 | 100.0 | 1120 | 100.0 | 1566 | 100.0 |
| Poor/rich ratio | | | 1.58 | | 1.22 | | 2.24 | | 4.90 | |
| POR | | | 0.62 | | 0.21 | | 0.32 | | 1.38 | |

There was an overall decrease in access to piped water from 19.4% in 1988 to 14.3% in 1994, but an increase in well water use from 63.6% (1988), to 68.6% (1994). The percentage of respondents in SES 5 with access to piped water decreased from 32% to 17%. The use of well water as a source of drinking water increased overall, with the largest percentage increase of 12% in the highest quintile.

*Table 17: Quintiles of SES by flush/Blair toilet, 1994 and 1988.
(Rural respondents)*

| SES | N | | 1994 (n=1629) | | 1988 (n=2461) | |
|-----------------|------|------|---------------|--------------|---------------|--------------|
| | 1994 | 1988 | N | % | N | % |
| 1 | 451 | 668 | 59 | 11.7 13.0 | 74 | 11.3 11.1 |
| 2 | 389 | 663 | 100 | 19.9 25.7 | 130 | 19.9 19.6 |
| 3 | 289 | 502 | 93 | 18.5 32.2 | 192 | 29.4 38.2 |
| 4 | 318 | 476 | 137 | 27.2 43.1 | 173 | 26.5 36.3 |
| 5 | 182 | 152 | 114 | 22.7 62.6 | 84 | 12.9 55.3 |
| Total | 1629 | 2461 | 503 | 100.0 | 653 | 100.0 |
| Poor/rich ratio | | | 0.52 | | 0.88 | |
| POR | | | 0.09 | | 0.10 | |

Overall there was an increase in the proportion of rural respondents with approved sanitary facilities, (flush or Blair toilet), from 26.5% in 1988, to 30.9% in 1994. The percentage of SES 5 with flush/Blair toilets increased by about 10% from 1988 to 1994, whilst the percentage in SES 3, decreased by 6%. The relative risk was the same for the two years. A respondent in the lowest quintile of SES only had one fifth the chance of having approved sanitation compared to one in the highest quintile.

Discussion:

In summary, the analysis of the DHS data for 1988 and 1994 in relation to socioeconomic status revealed interesting findings and trends, some of which can be linked to the effects of macroeconomic policies. Using factor analysis, the variables selected explained 54% of the variance in the 1994 data, and 34% in the 1988 data. In both cases, this amount of explanation is acceptable, as the number and type of socioeconomic variables available in the DHS data sets are very limited. Verification of the quintiles of SES through comparison with the assets, indicated that the categorizations were effective in discriminating between groups. The respondents in the bottom two quintiles of SES (40%) had minimal assets. This is supported by the findings of the Poverty Assessment Study (PASS), carried out in 1995, which reported that 45% of Zimbabwean households were “very poor” (Human Development Report 1998, Zimbabwe). The finding that a higher proportion of respondents in the lower quintiles of SES were in rural areas, is also supported by the finding in the PASS, that poverty was more prevalent in the rural areas: 75% were in the “total” poor category, compared to 39% of urban households. Education as a variable related to socioeconomic status was found to be less discriminating compared to factor analysis using assets. Whilst there was a gradient between increasing levels of education and assets, these differences were less stark compared to factor analysis. It is likely that the well-known association between education and socioeconomic status in Zimbabwe is conditioned by the high levels of unemployment, so that except at higher levels (“A” level and above), education does not necessarily confer a significant economic advantage.

In examining an indicator of health status, body mass index, there is a clear association between a low body mass index and low socioeconomic status. Twice as many of those in the lowest quintile of SES were low BMI, compared to those in the highest quintile of SES. At the same time, four times as many of those in the highest quintile of SES had the highest BMI compared to those in the lowest quintile. Compared to urban residents, women with a low BMI are more likely to be rural dwellers.

The nutritional status of young children, as measured by height for age, weight for age and weight for height, are sensitive to political and economic changes, largely through food availability and levels of illness. These indicators therefore can be useful for assessing the impact of both macro and micro-level economic policies. Except for stunting, there was an increase in the levels of malnutrition among children surveyed in the DHS, between 1988 and 1994. For all the nutrition indicators, there was a gradient of increasing malnutrition with decreasing SES. However, the proportion of stunted children of mothers in the highest quintile of SES increased between the two survey periods, even though overall levels of stunting declined. Compared to the other quintiles, there were also proportionately higher increases in the percentages of children malnourished, (under weight and wasted) in this quintile. Consequently the gap in the proportion of children wasting in the highest and lowest strata of SES narrowed between the two survey periods.

There are two possible explanations for these findings. One is that it is an impact of the structural adjustment programme. Households in Zimbabwe have grown poorer as a result of the ineffective implementation of this programme which lead to de-industrialization, and increases in inflation and unemployment (Human Development Report 1998). Children in the higher quintiles of SES might have initially been affected because their parents were more likely to have been employed in the formal sector, which initially felt this impact.

The other explanation is that these findings reflect the impact of the HIV/AIDS epidemic. Households that have wage earners are more likely to be particularly affected. The illness or death of the main wage earner is likely to precipitate that household into greater poverty, with the resulting nutritional impact on the children. It is possible also that households at higher levels of socioeconomic status were more likely to have members suffering from HIV/AIDS, compared to the poorer, (usually rural) households. It is difficult to disentangle these effects from the data available and it may be also that there is an interaction between HIV/AIDS and SES which together make households poorer than they would be than if they had experience from HIV/AIDS or a low/high SES alone.

The difference in the occurrence of diarrhoea between the lowest and the highest strata of SES also narrowed between 1988 and 1994. There was the expected inverse gradient of diarrhoea and SES, there were more reported episodes of diarrhoea among children in four of the five SES strata. Again, this finding could be related to a deterioration in living standards brought about through the impact of structural adjustment or the experience of HIV/AIDS in the household.

The relatively small difference between the rich and the poor in the proportion of low birth weight babies needs to be interpreted with care. These data refer to babies born in institutions, and disproportionately more babies of low income mothers are not born in institutions. However the overall increase of the prevalence of low birth weight babies could be related to a deterioration in living conditions.

Examination of the indicators of health services/practices indicate a similar trend; that in general there was a decline in services. The decline is more marked in the highest compared to the lowest SES group. As a result of this decline the gap between the rich and the poor decreased. This finding is most evident in the choice of the place of delivery. The poor/rich ratio halved to 3 in 1994. While the overall percentage of home deliveries increased marginally from 29% in 1988 to 32% in 1994, the proportion of home deliveries among the highest quintile nearly doubled to 17%. This probably reflects increasing barriers to the access of maternity services through the introduction of fees for service, particularly in urban areas. Fees increased substantially between 1988 and 1994, especially in urban areas. In rural areas, attempts were made to try to keep services affordable still. Nevertheless the gap between rich and poor remained large; compared to the highest quintile those in the lowest quintile were four times more likely to deliver at home.

The increasing cost of maternity services was reflected also in the dramatic decrease (from 13% to 3%) in the proportion of births taking place in the private sector. The lowest quintile of SES had an 88% decrease, the steepest decline among all the quintiles. With this decrease particularly, the gap between the rich and poor in their use of the private sector widened, with the poor /rich ratio increasing from 0.78 to 0.21.

The proportion of children fully immunized also declined between the two survey periods, with the largest decline of 10% among children in the highest SES quintile. Immunization services continued to be provided free in the rural and urban areas. However, there was an increasing emphasis on encouraging those with medical aid (health insurance) to make more use of the private sector. During this time period there was a policy shift to encourage the middle classes to use the private health care services, apparently so that the public services (and public funds) could be targeted more to the poor.

In contrast to the situation reflecting the provision of health care services, parity, (which reflects health practices, and is a composite indicator of education, contraceptive use and “development”), decreased for all levels of SES. However, the gap between rich and poor did not decrease and still remained high. Women in the lowest quintile were two and one half times more likely to have high parity (parity 5 or more), compared to women in the highest quintile.

One of the determinants of parity is female education. Whilst there was an overall decline in the proportion of women with no education, the gap between the poor and the rich remained very wide and had deepened. In 1994, a woman in the lowest quintile of SES was 11 times more likely to be uneducated compared to a woman in the highest quintile, a marginal increase from a prevalence odds ratio of 9. In contrast, the gap between the poor and the rich in terms of the provision of secondary education decreased substantially over the period 1988 to 1994. The poor/rich ratio decreased from 0.096 to 0.26. Taken together, these findings suggest that there was a differentiation of access to education. While progress had been in the proportion of women having secondary education, particularly among those in the lower quintiles of SES, there were still a of number poor women without any education at all.

Whilst there was a marginal decline in the overall proportion of rural households with piped water, the proportion of households with piped water in the highest quintile halved in 1994 compared with the proportion in 1988. Consequently the gap between the poor and rich narrowed, with the poor having 62% of the likelihood of having piped water compared to the rich in 1994. In 1988, the poor only had about a fifth of the likelihood of having piped water compared to the rich. The reduction in the proportion of households having piped water, particularly the better-off families, probably reflects the decrease in the provision of this service by government and consequent increasing cost. There was an element of subsidy in the provision of piped water supplies, but as households had to make a contribution to this provision, the better off households were more able to access this service. The richer households subsequently shifted to well water provision. The proportion of households in the highest quintile with well water as their source of drinking water increased from 58% to 71%, while that for the lowest quintile remained constant at 66%.

There was an overall increase of about 5% in the proportion of rural respondents with approved sanitary facilities, (flush or Blair toilet). However, gap between the rich and the poor remained the same. Households in the lowest quintile had only about a fifth of the chance of having approved sanitary facilities compared to those in the highest quintile.

Conclusion:

The analysis of the DHS data for the two time periods of 1988 and 1994 reflects an overall decline in both health status and health service provision. This decline was more marked for those in the highest socioeconomic status. The gaps between the rich and poor remained wide. Where the gaps appear to have decreased, this was due to a decline in the situation of the better off respondents rather than an improvement among the poor. The major health determinants of education, water and sanitation registered marginal improvements. However, education indicates a differentiation by socioeconomic status, with a substantial proportion of women having no education, while an increasing number having secondary education. The gap between the rich and the poor in water and sanitation remained constant, and were particularly wide for sanitation.

This situation reflects both the effects of the economic structural programme and the HIV/AIDS epidemic. With economic structural adjustment programme, there were declines in state support for the health and education sectors, and a deterioration in living standards with the accompanying de-industrialization and loss of jobs. The poorest respondents were rural and therefore less affected by the decline in the manufacturing sector and the job losses. The HIV/AIDS epidemic probably impacted on the health status indicators, and there could have been an interaction between the declining economic situation and the disease. It is however difficult to disentangle the effects of these two events. Using the DHS data in monitoring equity can be a useful tool, particularly in providing information on how the situation has changed over time.

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