Health Inequities in the African Region of the World Health Organization

Magnitudes, Trends and Sources
HEALTH INEQUITIES
IN THE AFRICAN REGION OF THE
WORLD HEALTH ORGANIZATION

WORLD HEALTH ORGANIZATION
Regional Office for Africa
Brazzaville • 2010

HEALTH PROMOTION CLUSTER
AFRO Library Cataloguing-in-Publication Data

Health inequities in the African Region of the World Health Organization

1. Socioeconomic factors
2. Health status indicators
3. Health services accessibility - trends
4. Cross-cultural comparison
5. Analysis of variance
6. African Region (WHO)
   I. World Health Organization. Regional Office for Africa

ISBN 978 929 023 1660 (NLM Classification: WA 30)

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Printed in India
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CONTENTS

ABBREVIATIONS ............................................................................................................................................................................................xiii
ACKNOWLEDGEMENTS....................................................................................................................................................................................xiv
FOREWORD ............................................................................................................................................................................................................xv
EXECUTIVE SUMMARY ...................................................................................................................................................................................xvii

1. INTRODUCTION .............................................................................................................................................................................................1

2. HEALTH INEQUALITIES AND INEQUITIES: CONCEPTS, DEFINITIONS AND MEASUREMENT ...............................................................4
   2.1 Health Inequalities and Inequities: Concepts and Definitions .................................................................................................................4
   2.2 The Measurement of Health Inequalities as a Proxy for Health Inequities .............................................................................................6
   2.3 Understanding What Contributes to Health Inequalities and the Associated Health Inequities ............................................................8
   2.4 Health Inequities, Health Policy and Development .............................................................................................................................8

3. METHODOLOGY ...........................................................................................................................................................................................10
   3.1 The Conceptual Framework .................................................................................................................................................................10
   3.2 Data – Types and Sources ....................................................................................................................................................................11
   3.3 Countries Covered ................................................................................................................................................................................13
   3.4 Indicators Analysed ..............................................................................................................................................................................13
   3.5 The Analytical Approach ..................................................................................................................................................................15
   3.6 Presentation of Country Reports ...........................................................................................................................................................18

4. COUNTRY REPORTS ON INEQUITIES AND TRENDS BASED ON THE ANALYSIS OF PUBLICLY AVAILABLE COUNTRY DHS DATA ....19
   4.1 Benin ...................................................................................................................................................................................................19
   4.2 Burkina Faso ........................................................................................................................................................................................22
   4.3 Cameroon ...........................................................................................................................................................................................29
   4.4 Central African Republic ......................................................................................................................................................................36
   4.5 Chad ...................................................................................................................................................................................................40
   4.6 Comoros ...............................................................................................................................................................................................43
   4.7 Congo (Republic of) ..........................................................................................................................................................................46
   4.8 Côte d’Ivoire ..........................................................................................................................................................................................49
   4.9 Ethiopia ...............................................................................................................................................................................................53
   4.10 Gabon .................................................................................................................................................................................................57
   4.11 Ghana .................................................................................................................................................................................................61
| 4.12 Guinea                                | 70  |
| 4.13 Kenya                                | 73  |
| 4.14 Lesotho                              | 81  |
| 4.15 Madagascar                           | 85  |
| 4.16 Malawi                               | 93  |
| 4.17 Mali                                 | 102 |
| 4.18 Mauritania                           | 105 |
| 4.19 Mozambique                           | 109 |
| 4.20 Namibia                              | 117 |
| 4.21 Niger                                | 120 |
| 4.22 Nigeria                              | 124 |
| 4.23 Rwanda                               | 128 |
| 4.24 Senegal                              | 136 |
| 4.25 South Africa                         | 145 |
| 4.26 Tanzania                             | 148 |
| 4.27 Togo                                 | 155 |
| 4.28 Uganda                               | 159 |
| 4.29 Zambia                               | 162 |
| 4.30 Zimbabwe                              | 170 |

5. **INEQUALITIES IN ACCESS TO AND USE OF VARIOUS TYPES OF HEALTH SERVICES WITHIN AND BETWEEN COUNTRIES IN THE AFRICAN REGION**
   
5.1 Introduction ................................................................. 175
   
5.2 Magnitudes and Trends of Inequalities and Inequities in Access to and Use of Health Services and Health Outcomes Within and Between Countries in the African Region ................................................................. 176
   
5.3 Inequities in Access to and Use of Various Types of Health Services Within and Between Countries in the African Region ................................................. 179
   
5.4 Inequities in Some Selected Health Outcomes Within and Between Countries in the African Region ................................................. 189
   
5.5 Decomposition of Inequalities – Factors Contributing to Inequities .............................................................................. 197
   
5.6 Conclusion ............................................................................... 200

6. **POLICY IMPLICATIONS AND RECOMMENDATIONS** ................................................................. 202
   
6.1 Policy Implications of the Documented Inequalities and Inequities and Suggested Recommendations ................................................................. 202
   
6.2 Challenges to Developing, Implementing and Evaluating Solutions ............................................................................... 207

GLOSSARY OF KEY TERMS ....................................................................................................................... 208

ANNEX: 1 List of countries with DHS data included in the analysis ................................................................. 209

BIBLIOGRAPHY ........................................................................................................................................... 212
Figures

2.1 Health Concentration Curve ................................................................. 7
3.1 Framework Adopted by the Commission on Social Determinants of Health ................................................................................................ 11
3.2 Example of Mass Deprivation to Marginal Exclusion: Moving Up the Coverage Ladder .............................................................................. 17
4.1 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Benin, DHS 2001 ........................................... 19
4.2 Selected Indicators by Wealth Quintile, Benin, DHS 2001 ................................................................................................................................. 20
4.3 Selected Indicators by Place of Residence, Benin, DHS 2001 ................................................................................................................................. 21
4.4 Selected Indicators by Education Level, Benin, DHS 2001 ................................................................................................................................. 21
4.5 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Burkina Faso, DHS 2003.............................. 22
4.6 Selected Indicators by Wealth Quintile, Burkina Faso, DHS 2003 ................................................................................................................................. 23
4.7 Selected Indicators by Place of Residence, Burkina Faso, DHS 2003 ................................................................................................................................. 24
4.8 Selected Indicators by Education Level, Burkina Faso, DHS 2003 ................................................................................................................................. 25
4.11 Factors Contributing to Inequalities in Skilled Birth Attendance, Burkina Faso, DHS 2003 ......................................................................................... 29
4.12 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Cameroon, DHS 2004 ........................................... 30
4.13 Selected Indicators by Wealth Quintile, Cameroon, DHS 2004 ................................................................................................................................. 31
4.14 Selected Indicators by Place of Residence, Cameroon, DHS 2004 ................................................................................................................................. 32
4.15 Selected Indicators by Education Level, Cameroon, DHS 2004 ................................................................................................................................. 32
4.18 Factors Contributing to Inequalities in Skilled Birth Attendance, Cameroon, DHS 2004 ......................................................................................... 36
4.19 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Central African Republic, DHS 1995.............. 37
4.20 Selected Indicators by Wealth Quintile, Central African Republic, DHS 1995 ................................................................................................................................. 38
4.21 Selected Indicators by Place of Residence, Central African Republic, DHS 1995 ................................................................................................................................. 39
4.22 Selected Indicators by Education Level, Central African Republic, DHS 1995 ................................................................................................................................. 39
4.23 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Chad, DHS 2004 ........................................................................... 40
4.24 Selected Indicators by Wealth Quintile, Chad, DHS 2004 ................................................................................................................................. 41
4.25 Selected Indicators by Place of Residence, Chad, DHS 2004 ................................................................................................................................. 41
4.26 Selected Indicators by Education Level, Chad, DHS 2004 ................................................................................................................................. 42
4.27 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Comoros, DHS 1996 ........................................... 43
4.28 Selected Indicators by Wealth Quintile, Comoros, DHS 1996 ................................................................................................................................. 44
4.29 Selected Indicators by Place of Residence, Comoros, DHS 1996 ................................................................................................................................. 45
4.30 Selected Indicators by Education Level, Comoros, DHS 1996 ................................................................................................................................. 45
4.31 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Congo, DHS 2005 ........................................... 46
4.32 Selected Indicators by Wealth Quintile, Congo, DHS 2005 ................................................................................................................................. 47
HEALTH INEQUITIES IN THE AFRICAN REGION OF THE WORLD HEALTH ORGANIZATION

4.70 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Madagascar, DHS 2003-2004 .......... 86
4.71 Selected Indicators by Wealth Quintile, Madagascar, DHS 2003-2004 ................................................................. 87
4.72 Selected Indicators by Place of Residence, Madagascar, DHS 2003-2004 ................................................................. 88
4.73 Selected Indicators by Education Level, Madagascar, DHS 2003-2004 ................................................................. 89
4.76 Factors Contributing to Inequalities in Skilled Birth Attendance, Madagascar, DHS 2003 ................................. 93
4.77 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Malawi, DHS 2004 .................. 94
4.78 Selected Indicators by Wealth Quintile, Malawi, DHS 2004 ................................................................................. 95
4.79 Selected Indicators by Place of Residence, Malawi, DHS 2004 ................................................................................. 96
4.80 Selected Indicators by Education Level, Malawi, DHS 2004 ................................................................................. 97
4.81 Trends in Skilled Birth Attendance by Wealth Quintile, Malawi, DHS 1992, 2000 and 2004 ................................. 100
4.82 Trends in Use of Modern Contraception for Women with Expressed Need for Contraception by Wealth Quintile, Malawi, DHS 1992, 2000 and 2004 101
4.84 Factors Contributing to Inequalities in Skilled Birth Attendance, Malawi, DHS 2004 ................................................................................. 102
4.85 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Mali, DHS 2001 ................................. 102
4.86 Selected Indicators by Wealth Quintile, Mali, DHS 2001 ................................................................................. 103
4.87 Selected Indicators by Place of Residence, Mali, DHS 2001 ................................................................................. 104
4.88 Selected Indicators by Education Level, Mali, DHS 2001 ................................................................................. 105
4.89 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Mauritania, DHS 2000 ................................................................................. 106
4.90 Selected Indicators by Wealth Quintile, Mauritania, DHS 2000 ................................................................................. 107
4.91 Selected Indicators by Place of Residence, Mauritania, DHS 2000 ................................................................................. 108
4.92 Selected Indicators by Education Level, Mauritania, DHS 2000 ................................................................................. 109
4.93 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Mozambique, DHS 2003 ................................................................................. 110
4.94 Selected Indicators by Wealth Quintile, Mozambique, DHS 2003 ................................................................................. 111
4.95 Selected Indicators by Place of Residence, Mozambique, DHS 2003 ................................................................................. 112
4.96 Selected Indicators by Education Level, Mozambique, DHS 2003 ................................................................................. 113
4.97 Trends in DPT3 Vaccination Coverage by Wealth Quintile, Mozambique, DHS 1997 and 2003 ................................. 115
4.98 Trends in Stunting in Children by Wealth Quintile, Mozambique, DHS 1997 and 2003 ................................. 116
4.99 Factors Contributing to Inequalities in Skilled Birth Attendance, Mozambique, DHS 2003 ................................................................................. 117
4.100 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Namibia, DHS 2000 ................................................................................. 117
4.101 Selected Indicators by Wealth Quintile, Namibia, DHS 2000 ................................................................................. 118
4.102 Selected Indicators by Place of Residence, Namibia, DHS 2000 ................................................................................. 119
4.103 Selected Indicators by Education Level, Namibia, DHS 2000 ................................................................................. 120
4.104 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Niger, DHS 1998 ................................................................................. 121
4.105 Selected Indicators by Wealth Quintile, Niger, DHS 1998 ................................................................................. 122
4.106 Selected Indicators by Place of Residence, Niger, DHS 1998 ................................................................................. 123
4.107 Selected Indicators by Education Level, Niger, DHS 1998 ................................................................................. 124
4.146 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Zambia, DHS 2001 ........................................ 163
4.147 Selected Indicators by Wealth Quintile, Zambia, DHS 2001 ........................................................................................................... 164
4.148 Selected Indicators by Place of Residence, Zambia, DHS 2001 ................................................................................................... 165
4.149 Selected Indicators by Education Level, Zambia, DHS 2001 ........................................................................................................... 166
4.152 Factors Contributing to Inequalities in Skilled Birth Attendance, Zambia, DHS 2001 ................................................................. 170
4.153 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Zimbabwe, DHS 1999 ........................................................................................................... 171
4.154 Selected Indicators by Wealth Quintile, Zimbabwe, DHS 1999 ........................................................................................................... 172
4.155 Selected Indicators by Place of Residence, Zimbabwe, DHS 1999 ........................................................................................................... 173
4.156 Selected Indicators by Education Level, Zimbabwe, DHS 1999 ........................................................................................................... 174
5.1 Inequities in coverage of DPT3 vaccination across and within countries in the African Region ........................................................... 179
5.2 Trends in DPT3 vaccination coverage over a five-year period: inequity versus average (19 countries in the African Region) ................ 180
5.3 Inequities in coverage of skilled birth attendance across and within countries in the African Region ...................................................... 181
5.4 Trends in skilled birth attendance over a five-year period: inequity versus average (20 countries in the African Region) ....................... 181
5.5 Inequities in current use of modern contraception (in women with expressed need for contraception) across and within countries in the African Region ................................................................. 182
5.6 Trends over a five-year period in contraception prevalence rate in women with expressed need for contraception: average versus inequity (20 countries in the African Region) ........................................ 183
5.7 Inequities in use of bednets by children across and within countries in the African Region ................................................................. 184
5.8 Inequities in use of bednets by pregnant women across and within countries in the African Region ........................................................ 185
5.9 Inequities in use of antimalarial drugs during pregnancy across and within countries in the African Region ........................................... 186
5.10 Inequities in counselling for HIV during antenatal care across and within countries in the African Region ............................................. 187
5.11 Inequities in access to safe water across and within countries in the African Region ............................................................................... 188
5.12 Inequities in access to safe sanitation across and within countries in the African Region ................................................................. 188
5.13 Inequities in infant mortality across and within countries in the African Region .................................................................................. 189
5.14 Trends in infant mortality over a five-year period: inequity versus average (20 countries in the African Region) ...................................... 190
5.15 Inequities in under-five mortality across and within countries in the African Region ........................................................................ 191
5.16 Trends in under-five mortality (over a five year period): inequity versus average (20 countries in the African Region) ....................... 192
5.17 Inequities in prevalence of children experiencing stunting across and within countries in the African Region ....................................... 193
5.18 Trends in stunting in children over a five-year period: inequity versus average (19 countries in the African Region) ............................. 193
5.19 Inequities in prevalence of women underweight across and within countries in the African Region ..................................................... 194
5.20 Trends in underweight in women: inequity versus average (19 countries in the African Region) ............................................................ 195
5.21 Inequity in prevalence of women overweight across and within countries in the African Region ............................................................ 196
5.22 Trends in overweight in women over a five-year period: inequity versus average (19 countries in the African Region) ....................... 196
5.23 Contribution of broad factors to inequalities in skilled birth attendance .................................................................................................. 198
5.24 Contribution of broad factors to socioeconomic inequality in child malnutrition (stunting) in five African countries ............................ 200
## Tables

1.1 Selected health status indicators for the major WHO regions

3.1 List of indicators

4.1 Trends in population averages and household wealth inequities for selected health and health care indicators, Burkina Faso, DHS 1993, 1998 and 2003

4.2 Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2003), Burkina Faso

4.3 Trends in population averages and household wealth inequities for selected health and health care indicators, Cameroon, DHS 1991, 1998 and 2004

4.4 Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2004), Cameroon

4.5 Trends in population averages and household wealth inequities for selected health and health care indicators, Ghana, DHS 1993, 1998 and 2003

4.6 Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2003), Ghana


4.8 Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2003), Kenya

4.9 Trends in population averages and household wealth inequities for selected health and health care indicators, Madagascar, DHS 1992, 2000 and 2004

4.10 Changes in inequities and population averages focusing on the most recent changes (between DHS 1997 and 2003/04), Madagascar

4.11 Trends in population averages and household wealth inequities for selected health and health care indicators, Malawi, DHS 1992, 2000 and 2004

4.12 Changes in inequities and population averages focusing on the most recent changes (between DHS 2000 and 2004), Malawi

4.13 Trends in population averages and household wealth inequities for selected health and health care indicators, Mozambique, DHS 1997 and 2003

4.14 Changes in inequities and population averages, Mozambique, DHS 1997 and 2003

4.15 Trends in population averages and household wealth inequities for selected health and health care indicators, Rwanda, DHS 1992, 2000 and 2005

4.16 Changes in inequities and population averages focusing on the most recent changes, Rwanda (DHS 2000 and 2005)

4.17 Trends in population averages and household wealth inequities for selected health and health care indicators, Senegal, DHS 1993, 1997 and 2005

4.18 Changes in inequities and population averages focusing on the most recent changes with complete information (between DHS 1993 and 2005), Senegal


4.20 Changes in inequities and population averages focusing on the most recent changes with complete information (between DHS 1996 and 2004), Tanzania

4.22 Changes in inequities and population averages focusing on the most recent changes (between DHS 1996 and 2001), Zambia ....................... 168
5.1 Summary of national average and inequity trends for various health and process indicators, 20 countries ....................................................... 178
5.2 Major determinants of inequalities identified under broad categories of the framework ................................................................. 197
5.3 Percentage contribution to inequalities in skilled birth attendance of seven of the most common determinants of inequalities in 11 countries with the most recent data

Boxes
Box 5.1 Important considerations when interpreting the results of magnitudes ......................................................................................................... 177
Box 5.2 Important considerations when interpreting the results of trends ................................................................................................................. 177
Box 6.1 Key Findings of the WHO Commission on Social Determinants of Health ................................................................................................... 206
# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AFRO</td>
<td>WHO Regional Office for Africa</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal Care</td>
</tr>
<tr>
<td>CSDH</td>
<td>Commission on the Social Determinants of Health</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
</tr>
<tr>
<td>DPT3</td>
<td>(Three-dose) diphtheria, pertussis and tetanus vaccine</td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>IMR</td>
<td>infant mortality rate</td>
</tr>
<tr>
<td>MCH</td>
<td>maternal and child health</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
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<tr>
<td>PHC</td>
<td>primary health care</td>
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<td>SBA</td>
<td>skilled birth attendance</td>
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<tr>
<td>U5MR</td>
<td>under-five mortality rate</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Acknowledgements

This report, which was prepared collaboratively across all levels of the Organization, is a re-analysis of demographic and health household survey data available in the public domain in 30 African countries from an equity and social determinants of health perspective. Due to slight differences in methods of calculating household asset quintiles and the year of survey data used, some estimates in this report differ from some estimates published in Demographic and Health Survey reports and MDG monitoring documents.

This report was prepared under the overall coordination of Dr Benjamin M. Nganda in the WHO Regional Office for Africa, Brazzaville, and Dr Ritu Sadana assisted by Dr Ahmad Reza Hosseinpoor in WHO Headquarters. Other contributing authors from across WHO include Dr Eyob Zere Asbu (WHO Malawi country office), Amit Prasad (WHO Kobe Centre, previously at WHO Headquarters) and Dr Jennifer Lee (WHO Headquarters). Primary contributing authors external to WHO include Dr Guillermo Paraje (Universidad Adolfo Ibáñez, Santiago de Chile, Chile) and Cecilia Vidal (Ministerio de Planificación del Desarrollo, La Paz, Bolivia) both of whom previously worked at WHO Headquarters.

Within the WHO Regional Office for Africa, the report preparation process benefited from the keen support of the Regional Director, Dr Luis Gomes Sambo who, on assuming office in 2005, made addressing the social determinants of health one of the five key strategic orientations of the work of the WHO in the African Region. Dr D. Nsue-Milang (Director, Health Promotion Cluster), Dr Chris Mwikisa (Director, Health Systems Cluster) and Dr Alimata J. Diarra-Nama (former Director, Division of Health Systems and Services Development and also former Director, Health Promotion Cluster, now WR/Senegal) were very supportive.

In the WHO Headquarters in Geneva, the preparation process was supported by the Information, Evidence and Policy Cluster led by Assistant Director General, Dr Timothy Evans. Dr Jeannette Vega, Acting Director, Department of Equity, Poverty and Social Determinants of Health, contributed to the analysis approach emphasizing alignment with the conceptual framework and approach of the WHO Commission on Social Determinants of Health. A working group composed of the contributing authors drawn from Headquarters and the African Region, including country offices, developed the outline of the report. Dr Ahmad Reza Hosseinpoor especially provided guidance on the analytical framework and decomposition analysis. We gratefully acknowledge the contributions of Dr Fiona Braka-Makmot and Mr Nasan Natseri from the WHO country office in Uganda, Mr Anthony Matovu from the Uganda Bureau of Statistics, and Dr Anthony Mbonye from the Ministry of Health, Uganda, to the relevance of the country profile templates.

Preliminary results were shared and discussed during a peer review seminar at WHO Headquarters, drawing on staff from across all clusters. Peer review comments by external experts in the area of equity analysis and those from the Publication Review Committee in the WHO Regional Office for Africa in Brazzaville, under the chairmanship of Dr P. Lusamba-Dikassa, Director of Programmes Management, were highly appreciated. We also wish to thank Ms. Jing Shen (Health Economics, University of Newcastle upon Tyne, UK) and Dr Joses Kirigia, Health Financing and Social Protection Programme in the Division of Health Systems and Services Development, WHO Regional Office for Africa in Brazzaville, for their contributions to the writing and review process. Anisa Khadem Nwachuku (The Earth Institute, Columbia University, USA) edited the report for technical content.
Foreword

The Constitution of the World Health Organization (WHO) asserts that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being. Yet, today, in many countries in the world, including those in the African Region, large numbers of people do not enjoy this basic right. The distribution of health, or health inequality, has become prominent on global policy agendas as researchers have come to regard average health status as an inadequate summary of a country’s health performance. Health inequality runs throughout life, from before birth through into old age. It exists between social classes, different areas of the country, between men and women, and between people from different ethnic backgrounds.

The story of health inequality is clear: the poorer you are, the more likely you are to fall ill and die young. Almost all serious health problems and major causes of premature death – be they communicable or non-communicable causes (such as cardiovascular disease and cancer) – are more common among people with lower levels of education, income and occupational status. The health gap in life expectancy is typically five years or more. Similarly, countries with the lowest incidence of poverty tend to have better health indicators compared to those with higher incidences of poverty.

Reducing health inequities is an important objective for every government – both on ethical considerations and because health equity is a central dimension of overall equity and justice. Equity means fairness and both health and health care are human rights, so every individual is entitled to these without prejudice based on the social groups to which they belong. In addition, good health is instrumental in enabling people to participate in society.

In 2005, the WHO established the Commission on the Social Determinants of Health to collect, collate and synthesize global evidence on the social determinants of health and their impact on health inequity, and to make recommendations for action to address such inequity. The Commission submitted its final report in 2008. The report clearly establishes that dramatic inequalities in health and health services exist worldwide and affect individuals in places where they spend their lives.

The World Health Assembly, in accepting the recommendations of the report, adopted a resolution urging Member States, WHO and development partners to work together to reduce health inequities through action on the social determinants of health. The resolution considers the actions and recommendations set out in the series of international health promotion conferences – from the Ottawa Charter on Health Promotion to the Bangkok Charter for Health Promotion in a Globalized World, making the promotion of health central to the global development agenda – as a core responsibility of all governments.

The WHO Regional Office for Africa is ready to work with Member States and development partners to implement this resolution. Narrowing the disparities in health especially between the rich and poor populations within and across countries, and making good health a reality for everyone in the African Region, are essential if we are to create an Africa of social justice as well as prosperity. In order to reduce health inequities and achieve equity in health and health care systematically, governments and policy-makers need to understand better what drives these inequities.

The development of research on social gaps in health and access to health care shows the need to re-examine the overall social and economic policies rather than health care policies alone. It is therefore essential to understand in each case not only how important the health sector interventions are, but also to be aware of the possible interventions outside the health sector to reduce health inequities.

In addition, addressing the social determinants of health is essential in order for the countries in the African Region to meet the health targets set in the Millennium Development Goals (MDGs). Without significant gains in poverty reduction, food security, education, women’s empowerment and living conditions, most countries will not attain the health-related goals. Without progress in health, other Millennium Development Goals will also remain beyond reach. Promoting health policies that tackle the basic cause of unfair and avoidable human suffering provides an opportunity to achieve the Millennium Development Goals.

As part of the effort of the WHO Regional Office for Africa to assist Member States to address the problem, this report provides some evidence on the existence of socioeconomic inequities in health and access to health care and health-related services for 30 countries in the Region. The health outcome
measures covered are infant mortality, under-five mortality, stunting in children, prevalence of underweight women, and prevalence of women overweight. The indicators relating to health care include coverage of DPT3 vaccination; use of bednets by children; use of bednets by pregnant women; current use of modern contraception (all women); current use of modern contraception (all women with expressed need for contraception); coverage of skilled birth attendance; use of antimalarial medicines during pregnancy; and counselling for HIV during antenatal care. Other indicators covered are access to safe water and sanitation. The report also describes the magnitudes and trends of the inequities, identifies the key determinants of some of the observed health inequities, and develops key messages for addressing them.

I hope that as a result of this report and the growing recognition of the problem, many countries in the African Region will respond by developing public policies and strategies in a wide variety of ways. Member States can learn from each other about different approaches to reducing health inequalities through systematic sharing of evidence, and WHO and partners stand ready to provide support to Member States in developing effective strategies and programmes. I trust this report will serve as a catalyst to countries’ desire to develop policy and action on health inequalities in their endeavour to implement the recommendations of the report of the WHO Commission on the Social Determinants of Health which was launched in August 2008 by Dr Margaret Chan, the WHO Director-General.

Dr Luis Gomes Sambo
Regional Director
Executive Summary

Dramatic differences in access to health services and health outcomes across population groups occur as the result of various types of social stratification. Economically- or socially-disadvantaged people in both rich and poor countries generally suffer from worse health than those who are better off. Poor people, particularly in low-income countries, lack material resources (nutritious food, clean water, adequate sanitation and housing) and have poor access to medical services, which contributes to a higher risk of disease and death. Even when they have access to medical services, the quality of care may be questionable.

The WHO African Region is characterized by substantial health inequities both across and within countries. The Region falls behind most other WHO regions in its overall health attainments. For instance, life expectancy at birth for males and females in the WHO African Region was estimated to be only 48 and 50 years respectively in 2007, compared with 72 and 78 years for males and females respectively in the WHO Region of the Americas. In several African countries, improvements in child survival have not translated into higher life expectancy because they have been offset by higher levels of adult mortality due to HIV/AIDS and conflict.

Given that inequities in health and health care arise from differential distribution of economic and social resources, addressing the social and economic determinants of health can contribute to greater and sustainable returns to existing health promotion efforts. It is essential to understand in each case not only how important health sector interventions are, but also to be aware of the possible interventions outside the health sector to reduce health inequities.

The report provides evidence on the existence of socioeconomic inequities in health within and across countries in the African Region, using the conceptual framework proposed by the Commission on Social Determinants of Health which illustrates the pathways by which social determinants affect health outcomes. Data from the most recent publicly available Demographic and Health Surveys (DHS) for thirty countries were analysed. The report presents findings on inequities in various health outcome measures, describes their magnitude and trends, identifies the extent of contribution of various determinants and develops key messages based on the results of the analysis.

Three main questions are addressed in the report:

1. **What is the extent of health inequities within countries and across the African Region?**

There is a wide range of within- and between-country inequities in health service coverage, safe water and sanitation and health outcomes. Most countries in the African Region exhibit the same pattern for urban/rural location, education and gender, that is people living in an urban area experience lower mortality rates than those living in a rural area; higher education results in lower mortality rates; and males experience higher mortality rates than females. Some countries show dramatic differences between the poorest and the richest population groups while others only a small difference.

Less infrastructure-dependent interventions such as the third dose of diphtheria, pertussis and tetanus vaccine (DPT3) coverage and mosquito bednet use either demonstrate less inequality or favour the poor. However, interventions requiring a strong health system for scaling up (e.g. skilled birth attendance) are more susceptible to disparity favouring the rich. With respect to wealth groups, although in general the wealthier the respondents the lower the mortality rates are, the patterns across the wealth groups are not consistent. For example, some countries have highest mortality rates in the middle and second richest wealth quintiles while in a few countries, the richest group has higher mortality rates than the second richest group.

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2. What are the major factors that contribute to health inequities across socioeconomic groups within countries?

Two variables were considered for in-depth analysis: skilled birth attendance and stunting in children less than five years of age. The contribution of underlying factors to inequities in these variables was analysed for 11 countries where data was available for skilled birth attendance and 5 out of the 11 countries for stunting in children. The analyses show that in all the 11 countries, socioeconomic position accounts for at least half of the socioeconomic inequity in skilled birth attendance, ranging from about 50% in Mozambique to nearly 78% in Madagascar.

Of all the individual factors that contribute to inequity in skilled birth attendance, household wealth is the biggest contributor to socioeconomic inequality in each of the 11 countries except for Malawi where mother’s education and area of residence have the same contribution as household wealth. Socioeconomic position is responsible for between 62% and 82% of the inequity in childhood stunting. The geographical, socioeconomic and political context (i.e. area of residence and region) plays an important role in Senegal and Rwanda while behavioural and biological factors largely contribute to the inequities in Cameroon and Senegal.

3. What are the major policy implications or actions that countries should consider given the results of the analysis?

Several main areas of action have been identified. First, there are significant factors outside the health sector contributing to health inequalities. The report findings emphasize the need for Member States to explicitly address health inequities by drawing on and strengthening action across sectors outside the health sector. A starting point is mainstreaming health equity into development agendas at the sectoral, national and regional levels. There is a wide range of entry points and interventions that Member States can undertake. Upstream factors include employment, social and health policies, welfare systems, health care systems, social and spatial environments, and living standards. Downstream factors include physical and psychosocial working conditions, health behaviour, and health care.

Second, there is an urgent need for countries and development partners to prioritize efforts to reduce poverty. The evidence provided in this report points to a powerful interrelationship between poverty and ill-health. Targeting the poor may not be adequate; yet, there is an intrinsic value of alleviating poverty and ill-health, particularly as a pattern of mass deprivation is frequently found in the Region.

Third, it is crucial to address the disparity in health status between the rich and the poor by addressing the social gradient. Interventions to address the health needs of the poor are central. Moreover, improvements in health outcomes and determinants in the poorest population group must be sufficiently rapid compared to other groups in order to reduce the disparity. This can be achieved by a combination of population-based interventions and additional services for poorer regions, communities, families or individuals.

Fourth, much can be learnt by improving health equity monitoring and evaluation (e.g. increasing availability of disaggregated data by equity stratifiers within each country and monitoring over time) as well as increasing opportunities for exchange of information. Information exchange and dialogue between African countries on what works to reduce health inequities would greatly improve the knowledge base available to policymakers.

In summary, addressing the social determinants of health is essential if the health targets set in the Millennium Development Goals (MDGs) are to be achieved in the African Region. Without significant gains in poverty reduction, food security, education, women’s empowerment and living conditions, most countries will not attain the health-related goals. Without progress in health, other MDGs will also remain beyond reach. Promoting health policies that tackle the basic causes of unfair and avoidable human suffering provides an opportunity to achieve the MDGs.

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1 Burkina Faso, Cameroon, Ghana, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Senegal, Tanzania and Zambia.
3 “Equity stratifiers” refers to dimensions or aspects used to classify populations or individuals for the purposes of examining equity. The key ones include socioeconomic groups/status, sex, place of residence, age, education level, etc.
1. INTRODUCTION

Dramatic differences in access to health services and health outcomes across population groups occur as the result of various types of social stratification. Economically- or socially-disadvantaged people in both rich and poor countries generally suffer from worse health than those who are better off. Poor people, particularly in low-income countries, lack material resources (nutritious food, clean water, adequate sanitation and housing) and have poor access to medical services, which contributes to a higher risk of disease and death. Even when they have access to medical services, the quality of care may be questionable.

The WHO African Region is characterized by substantial health inequities both across and within countries. Table 1.1 shows selected health status indicators for the major WHO regions.1

Table 1.1  Selected health status indicators for the major WHO regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Both sexes</th>
<th>Both sexes</th>
<th>Both sexes</th>
<th>Both sexes</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Region</td>
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<td>50</td>
<td>40</td>
<td>42</td>
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<td>438</td>
<td>165</td>
<td>99</td>
<td>40</td>
<td>910</td>
<td></td>
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<tr>
<td>Region of the Americas</td>
<td>72</td>
<td>77</td>
<td>63</td>
<td>67</td>
<td>171</td>
<td>97</td>
<td>24</td>
<td>20</td>
<td>11</td>
<td>140</td>
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</tr>
<tr>
<td>South-East Asia Region</td>
<td>62</td>
<td>65</td>
<td>54</td>
<td>55</td>
<td>272</td>
<td>207</td>
<td>68</td>
<td>51</td>
<td>35</td>
<td>460</td>
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<tr>
<td>European Region</td>
<td>69</td>
<td>77</td>
<td>62</td>
<td>68</td>
<td>231</td>
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<td>19</td>
<td>16</td>
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<td>39</td>
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<td>Eastern Mediterranean Region</td>
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<td>242</td>
<td>189</td>
<td>90</td>
<td>66</td>
<td>38</td>
<td>460</td>
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<tr>
<td>Western Pacific Region</td>
<td>71</td>
<td>75</td>
<td>63</td>
<td>66</td>
<td>157</td>
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<tr>
<td>Global</td>
<td>64</td>
<td>68</td>
<td>56</td>
<td>59</td>
<td>233</td>
<td>164</td>
<td>74</td>
<td>51</td>
<td>28</td>
<td>400</td>
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</tbody>
</table>


Thus, the African Region falls behind most other WHO regions in its overall health attainments. For instance, life expectancy at birth for males and females in the WHO African Region was estimated to be only 48 and 50 years respectively in 2007, compared with 72 and 78 years for males and females respectively in the WHO Region of the Americas. In several African countries, improvements in child survival have not translated into higher life expectancy because they have been offset by higher levels of adult mortality due to HIV/AIDS and conflict.

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Addressing the social determinants of health is essential if the health targets set in the Millennium Development Goals (MDGs) are to be achieved in the African Region. Without significant gains in poverty reduction, food security, education, women’s empowerment and improved living conditions in slums and rural areas, most countries will not attain the set health targets. Without progress in health, other MDGs will also remain beyond reach. Promoting health policies that tackle the social roots of unfair and avoidable human suffering provides an opportunity to achieve the MDGs.

The distribution of health, or health inequality, has become prominent on global policy agendas, as researchers have come to regard average health status measures as an inadequate summary of a country’s health performance. A clear understanding of the factors driving health inequalities is paramount in developing policies and interventions that support all segments of society, as well as directing services, treatment and care in proportion to need. The World Health Organization (WHO) is interested in measuring health inequality as a distinct dimension of the performance of health systems. There is evidence that policy, action and leadership to address the social dimensions of health can improve health and access to health care.2,3,4

Though the WHO recognized the role of key social determinants of health 30 years ago when it launched the primary health care (PHC) strategy,5 very little has happened in countries since then. Consequently, in 2005 WHO set up the WHO Commission on Social Determinants of Health (CSDH) to support countries and global health partners to address the social factors that lead to ill-health and health inequities, including understanding why the PHC strategy did not work and to advise on how it could be revitalized.

The Commission was charged with recommending interventions and policies to improve health and narrow health inequalities through action on social determinants. The Commission’s report was submitted to the WHO Director-General and published in August 2008. The report clearly establishes that dramatic inequalities in health and health services exist worldwide and affect individuals in places they spend their lives.

There has been growing interest in health inequalities in countries of the African Region, with many of them acknowledging inequalities in health as a serious social challenge to public health. In 2005, the fifty-fifth session of the WHO Regional Committee for Africa held in Maputo, following a panel discussion on “Social determinants of health and health inequalities: A matter of concern in the African Region”, called on the WHO Regional Office for Africa to develop a regional strategy outlining the roles of countries in the work of the WHO Commission on Social Determinants of Health.6

In 2006, at the fifty-sixth session of the Regional Committee for Africa, the ministers of health requested an update on the Commission’s work. In 2007, at the fifty-seventh session of the Regional Committee for Africa, the ministers of health adopted Document AFR/RC57/13 on “Key social determinants of health: a call for intersectoral action to improve health status in the WHO African Region”. The document called

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1 These include the standard health outcome measures used to compare health achievement in countries – such as infant mortality, childhood mortality, life expectancy at birth, maternal mortality ratio, etc.
6 However, this could not be done until the Commission finalized its work and made its recommendations. The Regional Office, however, continued sensitizing Member States on the need to address the social determinants of health.
on countries, inter alia, to establish a task force to fast-track the development and implementation of policies for addressing the key social determinants of health, in readiness for the anticipated WHO CSDH report.

The Sixty-second World Health Assembly (WHA), adopting the CSDH report, passed Resolution WHA62.14 on “Reducing health inequities through action on the social determinants of health”. The resolution considers the actions and recommendations set out in the series of international health promotion conferences – from the Ottawa Charter on Health Promotion to the Bangkok Charter for Health Promotion in a Globalized World, making the promotion of health central to the global development agenda – as a core responsibility of all governments.

The Sixty-second World Health Assembly also passed Resolution WHA62.12 related to primary health care. The resolution strongly reaffirms the values and principles of primary health care, including equity, solidarity, social justice, universal access to services, multisectoral action, decentralization and community participation as the basis for strengthening health systems. The Ouagadougou, the Libreville and the Algiers Declarations as well as many other regional declarations/aspirations call on countries in the African Region to address similar issues.

In order to act and monitor progress in addressing the social determinants of health in the African Region in line with Resolution WHA62.14, policy-makers need a good situation analysis to provide benchmarks for evaluating policy interventions. This report presents documented inequities in health outcomes and in health services access between the poorest and richest (least poor) households and across the entire population, in most countries of the African Region.

The report is organized in six chapters, in addition to this introduction which is Chapter 1. Chapter 2 presents the basic concepts and definitions of key terms and briefly introduces the approaches for measuring health inequalities and the associated health inequities. Chapter 3 presents an overview of the approach used in this report, including a discussion of the data types and sources, indicators and the analytical approach. Chapter 4 provides evidence on health inequalities including magnitudes and trends for 30 countries, based on results of the analyses. Chapter 5 discusses inequities in health and health services from the Regional perspective. Chapter 6 discusses the potential policy implications of the findings; options outlining some broad interventions, their potential effectiveness and pitfalls.
2. HEALTH INEQUALITIES AND INEQUITIES: CONCEPTS, DEFINITIONS AND MEASUREMENT APPROACHES AND ISSUES

2.1 Health Inequalities and Inequities: Concepts and Definitions

“Often, the term health inequalities is used as a synonym for health inequities, perhaps because inequity can have an accusatory, judgmental, or morally charged tone. However, it is important to recognise that, strictly speaking, these terms are not synonymous. The concept of health equity focuses attention on the distribution of resources and other processes that drive a particular kind of health inequality—that is, a systematic inequality in health (or in its social determinants) between more and less advantaged social groups, in other words, a health inequality that is unjust or unfair. … Not all health disparities are unfair.” ¹

Health inequalities and inequities in health

Health inequality is a generic term used to designate the differences in the health achievements of individuals and groups.²,³,⁴,⁵ There are many forms of health inequalities, such as the inequalities of health between genders, age groups, region of residence or occupations. However, health inequalities that are considered unjust, unfair and potentially-avoidable are of policy-makers’ primary concern, as not all inequalities are considered inequitable. This can be illustrated by the difference between men’s and women’s health. Women, in general, live longer than men. This could be a consequence of biological differences in which case this inequality appears unavoidable. Conversely, though, if women’s life expectancy is lower than men’s, it is likely that adverse social conditions act to reduce the natural longevity advantage of women. Such a scenario would be considered an inequity. It is important to note that inequalities or inequities are dynamic and reflect multiple determinants.

Inequity in health is the presence of systematic, unfair and potentially remediable differences in one or more aspects of health across populations or population groups defined socially, economically, demographically, or geographically.⁶ The World Health Organization has defined equity in health as the attainment of the highest level of physical, psychological and social well-being that biological limitations permit.⁷

⁵ International Society for Equity in Health (ISEQH) (2006), Equity and Health Sector Reforms in Latin America and the Caribbean from 1995 – 2005: Approaches and Limitations. Report commissioned by the International Society for Equity in Health – Chapter of the Americas. Also see definitions of these and other related terms on the ISEQH website at http://www.iseqh.org/workdef_en.htm (accessed Monday, 21 December 2009, 10:24 a.m.).
**Equity in the delivery of health care services**

Equity in the delivery of health care services refers to the levels of access, utilization and financing of health care services experienced by different population groups. Equity in delivery implies that the resources and services of the health sector are distributed and delivered in accordance with the needs of the population, and that they are financed in accordance with the population’s capacity to pay.\(^1,2,3,4,5\)

Thus, equity means that people’s needs rather than their social privilege guide the distribution of opportunities for their well-being. Social privilege is reflected by differences in dimensions, such as socioeconomic status, geographical location, gender and ethnic groups. Achieving equity in health and health care means that health attainment and the allocation and receiving of health services should not differ due to social privilege.

**Horizontal and vertical equity**

Two other concepts associated with equity are horizontal and vertical equity.\(^6\) Applied to the health field, the notion of vertical equity implies that individuals with different needs for health care are treated differently while horizontal equity suggests that those with equal needs be treated in a like manner.\(^7,8,9\) The former has almost exclusively been used in relation to financing, while the latter is the most widely used definition of equity in relation to health care use in the literature. For example, if applied to the analysis of equity in financing, horizontal equity requires that all individuals with equal resources pay equally, whereas vertical equity requires that consideration be given to the capacity to pay, i.e. individuals with more resources contribute more to finance the system. In other words, vertical equity is related to subsidies and progressiveness in the financing of the health care system.\(^10\) In reality, there are dramatic differences in health attainment and the receiving of health services across population groups within countries. These differences occur along a number of axes of social stratification (e.g. socioeconomic, political and cultural). Such inequities are seen in both rich and poor countries.\(^11,12,13,14,15,16\)

In general, the evidence shows...
that the lower an individual’s socioeconomic position is, the worse their health is or the fewer health services they receive.\(^1\) This generates a social gradient in health and health services that runs from top to bottom of the socioeconomic spectrum.\(^2\)

To make a fundamental improvement in health equity, technical and medical solutions such as disease control and medical care are critical and necessary though not sufficient. Given that inequities in health and health care arise due to differential distribution of economic and social resources in society, addressing social and economic determinants of health will yield greater and sustainable returns to existing efforts to improve health.\(^3\) Moreover, national averages for many important health indicators in many cases will not improve unless inequity in health is reduced.

### 2.2 The Measurement of Health Inequalities as a Proxy for Health Inequities

“While equity and equality are distinct, the concept of equality is indispensable in operationalising and measuring health equity. Equity in health means equal opportunity to be healthy, for all population groups. Equity in health thus implies that resources are distributed and processes are designed in ways most likely to move toward equalising the health outcomes of disadvantaged social groups with the outcomes of their more advantaged counterparts. This refers to the distribution and design not only of health care resources and programmes, but of all resources, policies, and programmes that play an important part in shaping health, many of which are outside the immediate control of the health sector”.\(^4\)

**Measurement approaches and issues**

Numerous studies have consistently shown inequities in health among socioeconomic groups, ethnic groups, geographical areas and other social categories for several decades. Because health inequities often reflect imbalances in power and wealth in society, addressing them requires strategic action. Descriptive data and information alone are not sufficient to resolve the problems; statistical analysis with rich data and good measures of inequity will, however, help more effectively to achieve targeted progress towards equity in health and health care.

There are several commonly used measures for measuring health inequality, both relative and absolute, within and across populations. Some of the commonly used measures of health inequality include\(^5\) : (i) range; (ii) concentration index (and associated concentration curve); (iii) index of dissimilarity; (iv) population attributable risk; and (v) slope and relative index of inequality.

**Classifying people by some measure of socioeconomic status**

As mentioned previously, data is required to stratify people into groups according to characteristics of interest. In most parts of the world, social advantage varies by some general equity stratifiers — socioeconomic status, gender and geographical area. These stratifiers interact in complex ways, and subgroups defined by several characteristics of these equity stratifiers are at a particular disadvantage, e.g. poor women living in rural areas. Socioeconomic position can be reflected by wealth and education. Household wealth or assets is a particularly meaningful measure of economic resources because accumulated assets can be used (e.g. when income is temporarily low) to cover health care expenses and

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2. In Chapter 4, when we discuss inequities in health outcomes and in access to health care services based on socioeconomic status, we shall implicitly be applying the concepts of horizontal and vertical equity.
maintain a standard of living that promotes health. Schooling (educational attainment) is an important indicator of social status in its own right and should not be viewed as a proxy for wealth or income. Sex-disaggregated data, analysed from a gender perspective, is also a meaningful equity stratifier for many, but not all, health measures.

Finally, groups can be stratified according to the geographical area (e.g. urban versus rural, or better- and worse-off provinces or districts) where they are born, live or work. Resources are often allocated on a geographical basis, reflecting both logistic issues such as distance, topography and transport as well as the tendency for political power to be concentrated in urban areas or particular regions. Comparing allocation of health measures across different provinces and districts is useful, and non-specialists easily understand such comparisons.

Comparing extreme groups – range and difference

Often simple measures are the most relevant to drive policy because they are readily understood by policy-makers and amenable to wider debate and discussion. Simple range measures, including the ratio and difference, are most frequently used in the literature to describe inequities between groups. These measures compare the occurrence of a health measure like, for example, child mortality, between female and male, between the poorest and the richest socioeconomic groups, or between urban and rural areas.

Comparing all groups/peoples simultaneously – the concentration index

In addition to the simple measure of inequalities, a more complex measure – the concentration index\(^1\) – is adopted to confirm conclusions about comparisons which are made based on the simpler ratio measure. In contrast to the simple measure, the more complex concentration index is a summary measure of the distribution of health across the full spectrum of socioeconomic stratifiers.

The concentration index has become a standard tool for the measurement of health inequality in health economics research, which provides a means of quantifying the degree of income or wealth-related inequality in a specific health variable.\(^2\) The concentration index is defined with reference to the concentration which plots the cumulative percentage of the population, ranked by living standards, beginning with the poorest, on the x-axis and the cumulative percentage of the health variable corresponding to each cumulative percentage of the distribution of the living standard variable on the y-axis (see Figure 2.1).

With the help of the concentration index, we can easily find where and to what extent a health variable is concentrated among the socioeconomic distribution; in other words, it shows whether the health variable is concentrated among the poorest or among the richest population groups and what the degree of concentration is. Any deviation from a 45 degree line (the straight line) indicates that inequality exists.

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2.3 Understanding What Contributes to Health Inequalities and the Associated Health Inequities

Decomposition Analysis\(^1\) is applied to understand what factors are contributing to the observed inequalities in health and health care.\(^2\) While the concentration index provides an overall measure of inequality, it is often useful to conduct analysis at a disaggregated level to understand the sources of inequality. In this regard, the concentration index is further decomposed into subgroups that are based on some major determinants of health that we have identified in the African context to know to what degree health inequity is concentrated within and between these subgroups. By applying this approach, we can identify a clear picture of the degrees of those determinants’ contributions to the overall inequalities.

Understanding the associated contributions of different determinants, such as those representing socioeconomic context, social position, health systems factors, or individual and biological factors, increases understanding of what contributes to health inequalities and where policy and programmes could potentially be developed to address them.

2.4 Health Inequities, Health Policy and Development

Inequity in health is evident throughout the world even in countries where aggregated data suggest improvement in average levels of health. Universally, inequities are considered unacceptable. Pursuing equity in health has long been high on policy-makers’ agenda as it is of moral and ethical concern to guarantee equal opportunity to attain the highest possible level of health for every individual in the society. In the 1990s, WHO issued a global initiative whose goal is to promote and support practical policies and action to reduce avoidable social gaps in health and health care.\(^3\) A decade later, inequalities and inequity in health, relative and absolute, still exist worldwide\(^4\); however, the magnitude varies significantly between regions and countries. The WHO African Region is characterized by substantial health inequities both across and within countries. This Region also lags behind most other regions in its overall health attainments.\(^5\)

The distribution of health across the population is considered equally important if not more important than the average achievement as an indicator of a country’s performance. Reducing health inequities is an important objective for every government for various critical reasons. First of all, there is an ethical concern: equity means fairness and both health and health care are human rights, so every individual is entitled to these without prejudice based on the social groups to which they belong.\(^6,7,8\) Secondly, health equity is a central dimension of overall equity

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and justice. It conditions the capabilities of individuals and groups to participate in and benefit from social and economic development. Thirdly, good health is instrumental in enabling people to participate in society, with potentially positive consequences for economic performance. Health inequities adversely affect vulnerable and impoverished populations, thereby further reducing their freedom to lead lives they have reason to value and to contribute to social and economic development, which is incompatible with long-term productivity.

In order to reduce health inequities and achieve equity in health and health care systematically, governments and policy-makers need to understand better what drives these inequities. The development of research on social gaps in health and health care shows the need to re-examine social and economic policies overall beyond health care policies alone. It is, therefore, essential to understand in each case not only how important health sector interventions are, but also to be aware of the possible interventions outside the health sector to reduce health inequities.
3. METHODOLOGY

This section describes the conceptual framework used to guide and interpret the analysis, the data sources, the indicators and their definitions, the analytical approach used to estimate descriptive statistics and the approach to decompose the factors contributing to the observed health inequities.

3.1 The Conceptual Framework

The conceptual framework is largely a synthesis of models developed by Dahlegren, Whitehead, Diderichsen, Hallqvist, etc., and which were used by WHO and the Commission on Social Determinants of Health. This conceptual model shown in Figure 3.1 illustrates the pathways by which social determinants of health affect health outcomes, makes explicit the linkages among different types of health determinants, and explains the ways social determinants contribute to health inequities among groups in society, given the increasing evidence of significant social stratification in health status. This conceptual framework served as the departure point on how to “operationalise” or make concrete monitoring and assessment, with the initial purpose of describing levels and potential linkages across components within national settings. The four key components of the model and associated questions are:

1. Geographical and socioeconomic context: What are the main characteristics of a country that influence the form and magnitude of social stratification as well as the implications of stratification for the circumstances in which people live and work?

2. Social stratification or socioeconomic position: (i) What are the key dimensions of social stratification?; and (ii) How extensive is the social stratification?

3. Differential exposures, vulnerabilities and consequences: What is the extent of (i) differential vulnerabilities, (ii) differential exposures and (iii) differential consequences? These include:
   (a) material circumstances, social cohesion, and behavioural and biological factors;
   (b) health system factors.

4. Differential outcomes in health: What are the main resulting health inequities that emerge in a given society and what is the extent of these health inequities?

This framework guided the approach to the analysis and interpretation of the results.

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3.2 Data – Types and Sources

The data used in the analyses come from the most recent Demographic and Health Surveys (DHS) that are in the public domain in countries. Demographic and Health Surveys are nationally-representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health and nutrition.

There are two main types of DHS Surveys:

(a) Standard DHS Surveys - which have large sample sizes in each country (usually between 5000 and 30 000 households) and typically are conducted every five years, to allow comparisons over time.

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2. All the DHS data that have been put in the public domain by countries are available on the following website: http://www.measuredhs.com/aboutsurveys/dhs/start.cfm. For each data-set, there is an accompanying code-book which describes the data variables and their characteristics, etc., in detail. People may use these data provided they acknowledge the source. Registration (free) is required.
(b) Interim DHS Surveys - which focus on the collection of information on key performance monitoring indicators but may not include data for all impact evaluation measures (such as mortality rates). These surveys are conducted between rounds of DHS surveys and have shorter questionnaires than DHS surveys. Although nationally representative, these surveys have smaller samples than DHS surveys (2000 – 3000 households).

The DHS capture information on a variety of indicators, including:

(a) Anaemia - prevalence of anaemia, iron supplementation;
(b) Child health - vaccinations, childhood illness;
(c) Education - highest level achieved, school enrolment;
(d) Family planning – knowledge and use of family planning, attitudes;
(e) Female genital mutilation - prevalence of and attitudes about female genital mutilation;
(f) Fertility and fertility preferences - total fertility rate, desired family size, marriage and sexual activity;
(g) Gender/domestic violence - history of domestic violence, frequency and consequences of violence;
(h) HIV/AIDS knowledge, attitudes and behaviour - knowledge of HIV prevention, misconceptions, stigma, higher-risk sexual behaviour;
(i) HIV prevalence - prevalence of HIV by demographic and behavioural characteristics;
(j) Household and respondent characteristics - electricity, access to water, possessions, education and school attendance, employment;
(k) Infant and child mortality - infant and child mortality rates;
(l) Malaria - knowledge about malaria transmission, use of bednets among children and women, frequency and treatment of fever;
(m) Maternal health - access to antenatal, delivery and postnatal care;
(n) Maternal mortality - maternal mortality ratio;
(o) Nutrition - breastfeeding, vitamin supplementation, anthropometry, anaemia;
(p) Wealth/socioeconomics - division of households into five wealth quintiles to show relationship between wealth, population and health indicators;
(q) Women's empowerment - gender attitudes, women's decision-making power, education and employment of men versus women.

Researchers have long used DHS data for the analysis of health issues, including socioeconomic inequities and their relation to health outcomes or processes across countries. Graham et al., (2004) showed strong associations between women’s poverty status and maternal...
death using DHS data from 10 developing countries. Houweling et al., (2007) found substantial inequities among wealth groups in maternity care, especially in professional delivery care based on DHS data from 45 developing countries, including a large number from the African Region. DHS from 55 developing countries were analysed by Gakidou and Vayena (2007) using wealth indices, revealing that, despite increases in national averages, use of modern contraception by the absolute poor remains low. Gwatkin, et al., (2007) provide a snapshot of global inequities using DHS data from 44 countries. However, few studies have used DHS data on a large scale with analysis conducted using a wide range of health indicators for both within and across country comparisons in the WHO African Region.

### 3.3 Countries Covered

The analysis covers 30 WHO African Region countries that had at least one recent DHS data (i.e. 2000 or later) in the public domain at the time the analysis was carried out in June 2008 (except for South Africa where the latest DHS data in the public domain is for 1998). The 30 countries are Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte D’Ivoire, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

### 3.4 Indicators Analysed

Fifteen indicators were included in the health equity analysis. The indicators which represent systems, processes and health outcomes were selected based on the availability of data across countries and over time in the countries within the African Region. However, depending on the country, between four and nine health outcome indicators and health system indicators were selected. Table 3.1 lists the indicators and provides some pertinent information about how the indicators are constructed.

### Table 3.1 List of indicators

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Infant mortality</td>
<td>Number of deaths occurring in age interval 0-11 months for children who were exposed to death in a five-year period</td>
<td>Number of children exposed in a five-year period</td>
<td>Calculated from a series of questions about deaths of children aged 0-11 months within the past five years</td>
</tr>
<tr>
<td>2</td>
<td>Under-five mortality</td>
<td>Number of deaths occurring in age interval 0-59 months for children who were exposed to death in a five-year period</td>
<td>Number of children exposed in a five-year period</td>
<td>Calculated from a series of questions about deaths of children aged 0-59 months in the previous five years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Stunting in children</th>
<th>Children with more than two standard deviations from reference median of height for age</th>
<th>All children born in the last five years</th>
<th>Calculated from a series of questions and measurements on each child born in the last five years</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Coverage of DPT3 vaccination</td>
<td>Children with 3 DPT vaccinations recorded in health card</td>
<td>All children born in the last five years that are 12 months or older at the time of the survey</td>
<td>Calculated from a series of questions about the vaccination status of each child born in the past five years</td>
</tr>
<tr>
<td>5</td>
<td>Access to safe water</td>
<td>Number of households where source of drinking water is considered as safe based on WHO classification</td>
<td>All households</td>
<td>What is the main source of drinking water?</td>
</tr>
<tr>
<td>6</td>
<td>Access to safe sanitation</td>
<td>Number of households where toilet facility is considered as safe based on WHO classification</td>
<td>All households</td>
<td>What kind of toilet facilities does your household have?</td>
</tr>
<tr>
<td>7</td>
<td>Use of bednets by small children</td>
<td>Number of households where all children under three/five slept under bednet last night</td>
<td>All households with children born three/five years prior to the survey</td>
<td>Did all, some or none of the children under age five who slept in the household last night sleep under a bednet?</td>
</tr>
<tr>
<td>8</td>
<td>Use of bednets by pregnant women</td>
<td>Number of women that slept under a bednet last night</td>
<td>All women of reproductive age</td>
<td>Did you sleep under a bednet last night? Yes/No</td>
</tr>
<tr>
<td>9</td>
<td>Prevalence of underweight women</td>
<td>Number of women with BMI below 18.5</td>
<td>All non-pregnant women of reproductive age</td>
<td>Calculated from a series of questions and measurements</td>
</tr>
<tr>
<td>10</td>
<td>Prevalence of women overweight</td>
<td>Number of women with BMI above 25</td>
<td>All non-pregnant women of reproductive age</td>
<td>Calculated from a series of questions and measurements</td>
</tr>
<tr>
<td>11</td>
<td>Current use of modern contraception (all women)</td>
<td>Number of women currently using modern contraception</td>
<td>All non-pregnant women of reproductive age</td>
<td>Are you currently doing something or using any method to delay or avoid getting pregnant? If yes, which method are you using?</td>
</tr>
<tr>
<td>12</td>
<td>Current use of modern contraception (all women with expressed need for contraception)</td>
<td>Women currently using modern contraception</td>
<td>All non-pregnant women of reproductive age who do not want to have more children or want to wait two or more years for next child</td>
<td>Are you currently doing something or using any method to delay or avoid getting pregnant? If yes, which method are you using?</td>
</tr>
<tr>
<td>13</td>
<td>Coverage of skilled birth attendance</td>
<td>Number of births assisted by doctor, nurse/midwife, auxiliary midwife or country-specific health professionals</td>
<td>All births in previous three/five years</td>
<td>Who assisted with the delivery of (NAME)? Anyone else?</td>
</tr>
</tbody>
</table>
3.5 The Analytical Approach

Descriptive analysis

The rates and proportions of all 15 indicators are reported, rounded to the nearest whole number for each country at national level. Where possible, the indicators have been analysed using the following equity stratifiers: 1 household wealth (five categories—quintiles), education (three categories of no education, primary education defined by one to six years of education and secondary education or higher defined by more than six years of education), area of residence (urban and rural areas) and sex (male and female).

An index as a proxy for household wealth was constructed using asset ownership and service (electricity, etc.) provision. This index, estimated using a non-parametric method, ordinally ranks all households; these are then classified into five categories, each reflecting 20% of all households. The ratios of the average levels in the two extreme wealth quintiles (poorest and richest) are used to assess the relative degree of inequity in health and health care for each of the indicators. Poorest to richest ratio is used for infant mortality rate, mortality rate for children under five years of age, stunting in children under five and prevalence of underweight in women. On the other hand, the richest to poorest ratio is used for prevalence of overweight in women, three-dose diphtheria, pertussis and tetanus (DPT3) vaccination coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

In the regional analysis (Chapter 5), the discussion simply uses the country analytical results to discuss patterns of health inequities in countries across the Region using two simple measures: the range and differences between groups. It is important to note that this section is not an attempt to compare inequities between countries since the data sets used for the respective countries do not coincide in time. The aim of the section is to underscore the fact that there are inequities virtually in all the countries and that they follow more or less similar patterns.

Trend analysis

In the eleven countries where DHS was available for two or more years, the descriptive analyses were repeated for previous survey(s) to assess the change of inequalities in the indicators over time. Table 3.2 summarizes the approach used to depict trends. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation. 2

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1 This refers to dimensions or aspects used to classify populations or individuals for the purposes of examining equity. The key ones include socioeconomic groups/status, sex, place of residence, age, education level, etc.

Indicators falling in the best outcome (cell A) are those for which the relative gap - or ratio - between the richest and poorest wealth quintiles narrows and the population average improves over time (between two or more DSH years). It is possible to see a widening of the relative gap with improving population average (cell B). One reason for this pattern could be a faster improvement in the richest group than in the poorest. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). The worst outcome (cell D) is when there is a widening of the relative gap and a worsening of the population average.

**The decomposition of socioeconomic inequality**

For policy purposes, it is especially relevant to understand why unfair and avoidable inequalities (inequities) exist and what actions may be taken to improve equity. Decomposition analysis is one approach used to quantify the contribution made by different factors to inequalities in health; it takes into account the socioeconomic distribution of determinants of health and health indicators. Therefore, it estimates which health determinants are associated with greater inequality in health. In other words, this method enables us to quantify the different contributions of each determinant of a health indicator - controlling for other determinants - to inequality in that health indicator. Descriptive data alone cannot identify a solution. Yet such analysis can serve as one input to aid in the development of evidence-based policies, relevant to a particular context or country, and to identify and reduce unfair and avoidable inequities.

The contribution of determinants to socioeconomic inequality in the use of “skilled birth attendants” (in all the 11 selected countries) and in “stunting in children” (in 5 out of these 11 countries) is estimated using the most recent DHS. For each variable, an analytical framework and different indicators are used for “skilled birth attendants” and “stunting in children”. The indicators included reflect the main categories of determinants (socioeconomic context, social position, health systems and individual/biological factors) and the likely pathways relevant to the African context. Further information on the indicators and measures (i.e. continuous, categorical, or binary) used in the multivariate models are listed in Annexes 2 and 3.

**Interpretation**

The extent and depth of inequality vary from region to region within countries, but also between countries. At one extreme are the poorest countries where large parts of the population are deprived of care, even among the better off. Only a small minority enjoys access to a
reasonable range of health benefits, creating a pattern of mass deprivation. At the other extreme are countries where a large part of the population enjoys a wide range of benefits but a minority is excluded: a pattern of marginal exclusion. Additionally, queuing is a pattern found between these two extremes in which richer population groups are better off while the poor have to wait for a “trickle-down effect.”1

Looking at health care coverage by wealth group provides a crude illustration of these different patterns (see Figure 3.2). Between the extremes of mass deprivation (typical for countries with major problems of supply of services and low-density health care networks) and marginal exclusion (typical for countries with dense health care networks) are the countries where poor populations have to wait to get access to health services and hope that benefits will eventually trickle down.2

Unless specific measures are taken to extend coverage and promote uptake in all population groups simultaneously, empiric evidence documents that the improvement of aggregate population coverage will go through a phase of increasing inequality. These complex dynamics also affect the distribution of health outcomes. For a long time policy-makers used aggregate health indicators to monitor health policies. As a result, national averages that show progress may conceal persisting or widening inequalities.

Figure 3.2  Example of Mass Deprivation to Marginal Exclusion: Moving Up the Coverage Ladder3

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2 In Figure 3.2, Bangladesh shows a mass deprivation situation – virtually all the people in quintiles 1 to 4 have no access to facilities for delivery. On the other hand, the Dominican Republic portrays a situation of marginal exclusion – people in the lowest wealth quintile have low access compared to those in the other wealth quintiles.

The manner in which systems based on primary health care develop will vary across these differing contexts. In the case of exclusion, programmes targeted at specific population groups, i.e. the poorest, are often urgently needed to achieve pro-equity outcomes while in other instances, such as mass deprivation, broad strengthening of the whole system or a combination of the two approaches is required. In this respect, the distribution of health outcomes and health opportunities across socioeconomic groups can provide a useful tool for health policy-makers as it can easily be used to classify countries according to the above mentioned patterns. It is important to note that different patterns for different indicators can exist within the same country.

In the country profiles, data is provided for social gradient in variables where more than two categories (quintiles, education groups, etc.) exist for all 30 countries for the latest DHS (that is available in the public domain). We also provide a trend analysis of the inequities for 11 countries.

3.6 Presentation of Country Reports

The country report section (Chapter 4) provides detailed country-specific reports. Each country report has a descriptive analysis section on the national average of infant and under-five mortality rates by stratifiers and, depending on the country, a number of other selected health indicators stratified by wealth quintiles, area and education. For 19 countries for which there was only one DHS survey, the country reports contain only the descriptive analysis. For the remaining 11 countries that had at least two DHS surveys available, an additional in-depth section discusses trends in population averages and wealth inequities as described in section 3.5.2. Annex 1 shows the list of the countries and the DHS surveys (years) used.

For the 11 countries with in-depth analysis, the trend analysis of national average and inequities over time are conducted for all the indicators. National averages often mask substantially worse outcomes for many disadvantaged groups and the widening inequity gaps. Therefore, poorest to richest ratio or richest to poorest ratio are used to assess the degree of health inequity. Poorest to richest ratio is used for infant mortality rate, under-five mortality rate, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate. Each of the health indicators is divided into four groups: improvement in both national average and inequity, improvement in either of these (inequity or national average) and worsening in both of these. Two health indicators are then selected, one from the best outcomes and the other from the worst outcomes to illustrate its relevant pattern.

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1 The countries for which an in-depth analysis was carried out include Burkina Faso, Cameroon, Ghana, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Senegal, Tanzania and Zambia.
4. COUNTRY REPORTS ON INEQUITIES AND TRENDS BASED ON THE ANALYSIS OF PUBLICLY AVAILABLE COUNTRY DHS DATA

4.1 Benin

Data used to assess inequities in health and access to health services come from Benin’s Demographic and Health Survey, 2001. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Benin. The health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of women underweight and overweight. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance and current use of modern contraception. Figure 4.1 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.

Figure 4.1 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Benin, DHS 2001
The mortality gradient shows that in 2001 households in the poorest quintile experience two times greater mortality than those in the richest quintile. There are also inequities in mortality associated with differences in the education level of the mother. Children whose mothers have no education are 1.1 times more likely to die before their first birthday than children whose mothers have a primary education, and 2.7 times more likely to die than those whose mothers have a secondary education. This suggests that primary education has a small effect in reducing mortality, whereas acquiring secondary education has a greater positive effect. Similarly, rural area residents experience 55% more mortality than urban residents. Consistent with the evidence in other countries of the Region, infant mortality for boys is higher than for girls; however, this is not the case for under-five mortality. Figure 4.2 shows six selected indicators, stratified by wealth quintile.

**Figure 4.2 Selected Indicators by Wealth Quintile, Benin, DHS 2001**

In terms of access to health services, the data show large inequities with different patterns of inequitable access. For example, the probability of having skilled birth attendance is two times higher for richest (or least poor) mothers than for poorest mothers, and use of modern contraception is 2.7 times higher for the richest than for the poorest. Interestingly, the evidence indicates that use of bednets by pregnant women has a U-shaped pattern where lower coverage is concentrated in the middle-wealth groups.

Inequalities in health status are also worth noticing. Prevalence of stunting in children presents some level of mass deprivation, as the majority of the population has equivalent and high levels of malnutrition while a small privileged group has much lower prevalence of stunting. On the other hand, the prevalence of underweight women is three times higher among the poorest women than among the richest women. Figure 4.3 depicts the rural-urban patterns for the same six indicators.
The figure shows that rural areas are at a disadvantage for all indicators. For example, a lower proportion of births in rural areas are attended to by skilled personnel; similarly, a lower proportion of pregnant women in rural areas use bednets or modern contraception. The prevalence of underweight women is higher in rural areas. The same is true of children who experience stunting – the proportion is higher in rural areas compared to urban areas. Figure 4.4 shows six indicators by education of the mother.
Nearly all women with secondary education or higher are assisted by skilled health personnel when giving birth, compared to only 68 percent of women without education. Similarly, a lower proportion of pregnant women with no education use bednets or modern contraception, compared to their more educated counterparts. Moreover, the prevalence of stunting in children is twice as high for children whose mothers are uneducated compared to children with educated mothers.

### 4.2 Burkina Faso

Data used to assess inequities in health and access to health services come from Burkina Faso’s Demographic and Health Survey, 2003. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Burkina Faso. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed unmet need for contraception. Figure 4.5 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.

**Figure 4.5 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Burkina Faso, DHS 2003**

The mortality gradient shows that in 2003 households in the poorest quintile experience a 54% higher infant mortality and 66% higher under-five mortality than households in the richest quintile. There are also inequities in mortality associated with differences in the education level of the mother. Infant mortality among children of mothers with no formal education is 22% higher than among children of mothers with at least some secondary education. Under-five mortality shows even graver inequity. Children of mothers with no formal education have an under-five
mortality rate which is more than 70% higher than children of mothers with some secondary education. Similarly, rural residents experience 54% more under-five mortality and 33% more infant mortality than urban residents. The infant mortality rate for boys is 9% higher than that for girls and under-five mortality for males is 2% higher than for females. Figure 4.6 shows six indicators, stratified by wealth quintile.

Figure 4.6  Selected Indicators by Wealth Quintile, Burkina Faso, DHS 2003

Members of households in the wealthiest quintile are 76% more likely to receive DPT3 vaccines and 5.4 times more likely to have a skilled health attendant during childbirth compared to the poorest households. Women in the poorest quintile are 2.9 times more likely to be underweight compared to those from the richest quintile. The proportion of stunting of children in poor households is 140% higher than those in the richest households. Women in the poorest quintile are 9.8 times more likely to express unmet need for contraception compared to those in the richest quintile. However, the use of bednets by pregnant women is 10% higher in the lowest quintile compared to the middle quintile. Figure 4.7 shows the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage in all six indicators. For example, a higher proportion (37%) of children living in urban areas receive DPT3 vaccines compared to those living in rural areas and births in urban areas are attended to more frequently (almost three times more frequent) by skilled personnel. The same is true of children who experience stunting – the proportion is twice as high in rural areas as in urban areas. The prevalence of underweight women in rural areas is almost 3 times (167%) higher than in urban areas. Additionally, women with unmet need for contraception are almost five times higher in rural areas. Figure 4.8 depicts the patterns of the distribution of six indicators, by education of the mother.
DPT3 coverage is almost 50% higher for children whose mothers have at least some secondary education than for children whose mothers have no formal education. Similarly, a skilled birth attendant assists 95% of women with at least some secondary education during delivery compared to only 33% of women with no education. Moreover, only 9% of women without education and with expressed need for contraception use modern contraception compared to 50% of women with some education. The same pattern is evident with childhood stunting – the proportion of children who experience stunting is higher (3.4 times) for children whose mothers report no education compared to those whose mothers have at least some secondary education. The prevalence of underweight women is 147% higher among the least educated compared to the most educated.

**Trends in population averages and wealth inequities**

Table 4.1 summarizes the trends of health status and health system indicators. For health status indicators, the findings between 1993 and 1998 show a worsening trend. Yet, an overall improvement between 1993 and 2003 is noted for average levels of infant and under-five mortality. Conversely, an increasing prevalence of underweight and overweight women exists between 1993 and 2003. Stunting in children shows a persistent worsening trend throughout the 10-year period. For health system indicators, the three surveys show overall improvement in national averages across all indicators except coverage of skilled birth attendance.

| Indicator                                      | Population average |          |          |          |          |
| **Health status**                             |        |        |        |        |        |        |
| Infant mortality                              | 93.7   | 105.3  | 81.4   | 1.5    | 1.9    | 1.5    |
| Under-five mortality                          | 187.2  | 219.1  | 183.7  | 1.5    | 1.8    | 1.7    |
| Prevalence of stunting in children            | 33.3   | 36.8   | 38.6   | 1.7    | 1.8    | 2.5    |
| Prevalence of underweight women               | 14.9   | 13.4   | 20.6   | 1.9    | 1.8    | 2.7    |
| Prevalence of women overweight                | 7.0    | 5.5    | 9.1    | 5.4    | 5.7    | 12.3   |
| **Health systems**                            |        |        |        |        |        |        |
| Coverage of DPT3 vaccination                  | 34.9   | 32.5   | 50.4   | 1.9    | 2.0    | 1.8    |
| Coverage of skilled birth attendance          | 41.4   | 31.0   | 37.8   | 4.0    | 4.0    | 5.3    |
| Current use of modern contraception for women | 5.9    | 8.5    | 13.3   | **     | 11.9   | 8.8    |

* Poorest to richest ratio is used for infant mortality rate, under-five mortality rate, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

** Poorest as denominator is zero.

Focusing on the relative gaps between 1998 and 2003, the different indicators present different patterns in terms of inequity. The relative gaps in coverage of skilled birth attendance, stunting in under-five children, and prevalence of underweight women exhibit an increase in inequity, particularly for women overweight. A slight decrease in inequity is documented for infant and under-five mortality rates, DPT3 coverage and use of modern contraception for women with expressed need for contraception.

Table 4.2 summarizes trends, focusing on the most recent changes between 1998 and 2003, in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to developing or assessing health policies and their implementation.¹

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### Table 4.2  Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2003), Burkina Faso

<table>
<thead>
<tr>
<th>Population average</th>
<th>Improving</th>
<th>Relative gap</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Best outcome</strong></td>
<td></td>
<td>- DPT3 coverage</td>
<td></td>
<td>- Delivery by skilled birth attendants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use of modern contraception for women with expressed need for contraception</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Infant mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Under-five mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D. Worst outcome</strong></td>
<td></td>
<td>- Stunting</td>
<td></td>
<td>- Prevalence of overweight among women</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of underweight among women</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between the richest and poorest wealth quintiles narrows and the population average improves over time. Two of the health system indicators - DPT3 coverage and use of modern contraception for women with expressed need for contraception – and two of the health status indicators – infant and under-five mortality rates – represent this pattern. It is worth noting that for the indicator - use of modern contraception, the trend of inequity is different between all women and women with expressed need for contraception. Figure 4.9 illustrates this pattern in DPT3 coverage focusing on the changes between 1993 and 2003.

It is possible to see a widening of the relative gap with improving population average (cell B). One reason for this pattern could be a faster improvement in the richest group than in the poorest. This is the case in coverage of skilled birth attendance: in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a bit. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C) although this situation was not evident in Burkina Faso based on the data that was analysed.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: stunting in children falls in this category (Figure 4.10) along with prevalence of women who are overweight and underweight.
Figure 4.9  Trends in DPT3 Vaccination Coverage by Wealth Quintile, Burkina Faso, DHS 1993, 1998 and 2003

![Graph showing trends in DPT3 vaccination coverage by wealth quintile.]

Figure 4.10  Trends in Stunting in Children by Wealth Quintile, Burkina Faso, DHS 1993, 1998 and 2003

![Graph showing trends in stunting in children by wealth quintile.]

Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequality for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint key factors that are associated with the observed inequality in access to skilled birth attendance.

Figure 4.11 Factors Contributing to Inequalities in Skilled Birth Attendance, Burkina Faso, DHS 2003

Based on available data, Figure 4.11 shows that wealth is by far the most important underlying factor associated with almost 42% of the inequality in access to skilled birth attendance. Wealth combined with all socioeconomic factors account for almost 54% of the inequality. Health system factors taken together account for more than 27% of the inequality and therefore also contribute significantly to inequality in access to skilled birth attendance. For Burkina Faso, these results imply that policies and interventions that address socioeconomic position, as well as improvements in health systems that reach all areas of the country are both needed to reduce the inequities documented.

4.3 Cameroon

The data used to assess inequities in health and access to health services come from Cameroon’s Demographic and Health Survey, 2004. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Cameroon. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception, use of antimalarial drugs during pregnancy and counselling for HIV during antenatal care. Figure 4.12 shows infant and under-five mortality, stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The data show that in 2004 households in the poorest quintile experienced 1.3 times more infant mortality than households in the richest quintile. While the gradient for under-five mortality is much steeper, reflecting more pronounced inequities experienced by poorer wealth groups, the gradient for infant mortality depicts smaller disparities across wealth quintiles. There are also inequities in mortality associated with the level of educational achievement of the mother. Children whose mothers report no education are 15% more likely to die before their first birthday than children whose mothers report having a secondary education or higher, but less likely to die than children whose mothers report primary education. The gradient by education for under-five mortality shows larger inequities and reflects a pattern similar to mass deprivation, as children of women with at least secondary education have considerably lower rates of mortality than the rest. Moreover, rural residents experience 16% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than for girls.

Figure 4.13 shows seven indicators, stratified by wealth quintile.
In terms of access to health services, the data show large wealth-related inequities. For example, skilled health personnel assist almost all mothers in the richest quintile (93%) during delivery versus only 35% of mothers in the poorest group. Similarly, coverage of current use of modern contraception is almost 7 times higher in the richest quintile than in the poorest quintile, and counselling for HIV during antenatal care is 3.6 times more likely for the richest women than for the poorest. Such inequities can be described as queuing, as middle-wealth and upper-wealth groups benefit the most. Interestingly, the evidence also indicates that use of bednets by pregnant women increases with wealth but declines among the richest group.

Inequities in health status are also worth noticing, and the gradient is consistent with a pattern of queuing. Prevalence of stunting in children in the poorest households is three times higher than in the richest households. A similar pattern holds for prevalence of underweight women, although the differences are smaller in absolute terms. Figure 4.14 depicts the rural-urban patterns for seven indicators.
Figure 4.14  Selected Indicators by Place of Residence, Cameroon, DHS 2004

The figure shows that rural areas are at a clear disadvantage in all indicators depicted. For example, relative to rural areas, the probability of having skilled birth attendance in urban areas is almost two times higher, and both use of modern contraception and counselling for HIV during antenatal care are 2.3 times higher in urban areas. These data also show that use of bednets is 1.5 times higher among pregnant women living in urban areas compared to rural areas. Similarly, the prevalence of stunting in children is 65% higher in rural areas. The same is true for the prevalence of underweight women although the disparity is small. Figure 4.15 shows seven indicators by education of the mother.

Figure 4.15  Selected Indicators by Education Level, Cameroon, DHS 2004
Skilled personnel assist most women with at least secondary education (92%) during childbirth, compared to only 23% of women with no education. Similarly, only 2% of women with no education and with expressed need for contraception use a modern contraception method, compared to 31% in the more educated group. Coverage of counselling for HIV during antenatal care also shows large inequities, as women with secondary education are more than 7 times more likely to receive counselling than uneducated women. The prevalence of underweight women also appears higher among women with no education. The same is true of children who experience stunting – the proportion is higher among children born to uneducated mothers. Gains in these health outcomes are evident with each additional increment in level of education.

**Trends in population averages and wealth inequities**

Table 4.3 summarizes the trends of health status and health system indicators. The findings indicate that between 1991, 1998 and 2004, for population averages, there was an increase in infant and under-five mortality followed by a decline; however, the average is still slightly worse than 1991. The prevalence of stunting in children worsened over the three survey periods. Underweight and overweight prevalence in women are only available for 1998 and 2004. The findings show that the prevalence of underweight women has improved whereas the prevalence of women overweight has worsened. For health system indicators, there have been consistent improvements in DPT3 coverage and use of modern contraception. Skilled birth attendance has stayed relatively constant with a moderate dip in 1998.

**Table 4.3 Trends in Population Averages and Household Wealth Inequities for Selected Health and Health Care Indicators, Cameroon, DHS 1991, 1998 and 2004**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>64.3</td>
<td>77.0</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>125.3</td>
<td>150.7</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>26.0</td>
<td>29.3</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>7.6</td>
<td>6.6</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>20.7</td>
<td>28.6</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>39.5</td>
<td>42.0</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>63.5</td>
<td>58.8</td>
</tr>
<tr>
<td>Current use of modern contraception for women with expressed need for contraception</td>
<td>5.6</td>
<td>12.2</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.
Focusing on the most recent changes between 1998 and 2004, the indicators present different patterns in terms of inequality trends over the six-year time period. The relative gap in the prevalence of stunting in children exhibits an increase in inequity, whereas a decrease in inequity is documented for all other indicators.

Table 4.4 summarizes trends, focusing on the most recent changes between 1998 and 2004, in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.1

Table 4.4  Changes in Inequities and Population Averages Focusing on the Most Recent Changes (Between DHS 1998 and 2004), Cameroon

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving</td>
<td>A. Best outcome</td>
<td>- DPT3 coverage</td>
<td>B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delivery by skilled attendants</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use of modern contraception for women with expressed need for contraception</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Infant mortality rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Under-five mortality rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of underweight among women</td>
<td></td>
</tr>
<tr>
<td>Worsening/status quo</td>
<td>C.</td>
<td>- Prevalence of overweight among women</td>
<td>D. Worst outcome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Stunting</td>
<td></td>
</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between the richest and poorest wealth quintiles narrows and the population average improves over time. All the health system indicators and prevalence of underweight women represent this pattern. Figure 4.16 illustrates this pattern in DPT3 coverage, focusing on the most recent changes between 1998 and 2004.

It is possible to see a widening of the relative gap even with improving population average (cell B) although this situation was not seen in Cameroon based on the indicators analysed. It is also possible to see a worsening in the population average coupled with a narrowing of the relative gap (cell C). Prevalence of women overweight falls in this category. The worst outcome (cell D) is when there is a widening of the relative gap and a worsening of the population average as seen in stunting among children between the two survey years (Figure 4.17).

Figure 4.16  Trends in DPT3 Vaccination Coverage by Wealth Quintile, Cameroon, DHS 1991, 1998 and 2004

Figure 4.17  Trends in Stunting in Children by Wealth Quintile, Cameroon, DHS 1991, 1998 and 2004
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequality for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint key factors associated with the observed inequality in access to skilled birth attendance.

Figure 4.18 Factors Contributing to Inequities in Skilled Birth Attendance, Cameroon, DHS 2004

These findings suggest that policies and interventions that address socioeconomic position (wealth, education), as well as improvements in access to services in rural areas and across all regions, are both needed to reduce the inequities documented.

4.4 Central African Republic

The data used to assess inequities in health and access to health services come from Central African Republic’s Demographic and Health Survey, 1995. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for the Central African Republic. Health indicators include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Figure 4.19 shows infant and under-five mortality for the whole country stratified by wealth quintile, place of residence, educational achievement and sex of the child.
Figure 4.19  Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Central African Republic, DHS 1995

The data show that in 1995 households in the poorest quintile experience 1.7 times more infant mortality than households in the richest quintile. The mortality gradient by wealth quintile reflects a pattern where the richest 40% of the population have similar and significantly lower levels of mortality than the rest of the population. There are also inequities in mortality associated with educational achievement of the mother. Children whose mothers have no education are more than twice more likely to die before their first birthday than those whose mothers have a secondary education or higher, but only 1.2 times more likely than those whose mothers have a primary education. Similarly, rural area residents experience 35% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are considerably higher than those for girls. Figure 4.20 shows five indicators, stratified by wealth quintile.
In terms of access to health services, the data show large wealth-related inequities in all indicators. Children in the richest population group are three times more likely to be fully vaccinated against DPT3 than their counterparts in the poorest population group and wealthier mothers are almost 7 times more likely to be assisted by skilled health personnel during delivery than the poorest mothers. Coverage of current modern contraception use among women with expressed need for contraception is still extremely low and almost exclusively concentrated in the richer population groups.

Inequities in health status are less pronounced but also worth noticing, and the gradient reflects a pattern of queuing. Prevalence of stunting in children in the poorest households is 54% higher than in the richest households. Although the prevalence of underweight in women is only 4 percentage points higher among the poorest women than the richest women, this difference is significant in relative terms. Figure 4.21 depicts rural-urban patterns for five indicators.
The figure shows that rural areas are at a clear disadvantage in all five indicators depicted. For example, twice as many children are fully covered by DPT3 vaccination in urban compared to rural areas, and the probability of having skilled birth attendance during childbirth is more than three times higher in urban areas than in rural areas. Similarly, the prevalence of underweight women is higher in rural areas. The same is true of children who experience stunting – the proportion is higher in rural areas compared to urban areas. Figure 4.22 shows five indicators by education of the mother.

**Figure 4.21  Selected Indicators by Place of Residence, Central African Republic, DHS 1995**

**Figure 4.22  Selected Indicators by Education Level, Central African Republic, DHS 1995**
Skilled personnel assist most women (88%) with at least secondary education during childbirth, compared to only 29% of women with no education. Similarly, only 2% of women without education and with expressed need for contraception use a modern contraception method, compared to 20% in the more educated group; on an absolute basis, this is very low across all education groups. The prevalence of underweight women also appears higher among the uneducated. The same is true of children who experience stunting – the proportion is higher for children whose mothers are uneducated compared to those whose mothers have more education.

4.5 Chad

The data used to assess inequities in health and access to health services come from Chad’s Demographic and Health Survey, 2004. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Chad. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Figure 4.23 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.

**Figure 4.23  Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education level and Sex, Chad, DHS 2004**

![Graph showing infant and under-five mortality](image)
The data show that in 2004 households in the poorest quintile experience similar levels of under-five mortality and 1.2 times higher infant mortality than households in the richest quintile. The mortality gradient by wealth reflects an unusual pattern where quintile 4 stands out with considerably higher mortality rates. There are also inequities in mortality associated with mother’s level of educational achievement. Children whose mothers have no education are 1.2 times more likely to die before their first birthday than those whose mothers have a secondary education or higher. But, consistent with the mortality gradient by wealth, the gradient by education suggests that the highest level of mortality is not among the uneducated but among children of women with primary education. Moreover, rural area residents experience 44% more infant mortality compared to urban residents. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.24 shows five indicators, stratified by wealth quintile.

Figure 4.24  Selected Indicators by Wealth Quintile, Chad, DHS 2004

In terms of access to health services, the data show large wealth-related inequities, mainly between the richest population group and the rest of the population. Note that inequities across quintiles 1 to 4 are much smaller, reflecting mass deprivation. Children in the richest group are 10 times more likely to be fully covered by DPT3 vaccination than their counterparts in the poorest group and wealthier mothers are 25 times more likely to be assisted by skilled health personnel during delivery. Similarly, coverage of current modern contraception use among women with expressed need for contraception is still very low and almost exclusively concentrated in the richest quintile.

Inequities in health status are less pronounced but also worth noticing, and the gradient reflects a pattern of queuing. Prevalence of stunting in children in the poorest households is 42% higher than in the richest households, with households in quintiles 2 and 3 and the poorest quintile showing similar levels. The percentage of underweight women is almost double among the poorest women than among the richest women. Figure 4.25 depicts the rural-urban patterns for five indicators.
Figure 4.25  Selected Indicators by Place of Residence, Chad, DHS 2004

The figure shows large disparities between rural and urban areas, especially in indicators of access to health services. For example, coverage of DPT3 vaccination is about 2.1 times higher in urban areas whereas coverage of skilled birth attendance is almost 8 times higher in urban areas than in rural areas. Equivalent magnitude of variation exists for modern contraception use. The prevalence of underweight women is also higher in rural areas. Additionally, the proportion of children who experience stunting is 1.3 times higher in rural areas compared to urban areas. Figure 4.26 shows five indicators by education of the mother.

Figure 4.26  Selected Indicators by Education Level, Chad, DHS 2004
Skilled personnel assist 72% of women with at least secondary education during childbirth, compared to only 10% of women with no education. Similarly, only 1% of women with no education and with expressed need for contraception use modern contraception compared to 21% in the more educated group. The prevalence of underweight women is also higher among the uneducated. The same is true of children who experience stunting – the proportion is higher for children whose mothers are uneducated compared to those whose mothers have more education.

### 4.6 Comoros

The data used to assess inequities in health and access to health services come from Comoros’ Demographic and Health Survey, 1996. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Comoros. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Figure 4.27 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.

**Figure 4.27  Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Comoros, DHS 1996**
The data show that in 1996 households in the poorest quintile experience more than twice the mortality rate of households in the richest quintile. The mortality gradient by wealth quintile reflects a pattern where the poorest 40% of the population have significantly higher levels of mortality than the rest of the population. There are also inequities in mortality associated with mother’s level of education. Children whose mothers have no education are 2.4 times more likely to die before their first birthday than those whose mothers have a secondary education or higher, but only 1.4 times more likely than those whose mothers have a primary education. Similarly, rural residents experience 47% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant mortality rates for boys are considerably higher than those for girls. Figure 4.28 shows four indicators, stratified by wealth quintile.

**Figure 4.28  Selected Indicators by Wealth Quintile, Comoros, DHS 1996**

![Graph showing selected indicators by wealth quintile.](image)

In terms of access to health services, the data show large wealth-related inequities in coverage of skilled birth attendance: wealthier mothers are two times more likely to be attended to by skilled health personnel during delivery than the poorest mothers. Although use of modern contraception is higher than in other countries in the Region, there are still significant proportions of unmet needs and relative inequities across socioeconomic groups.

Inequities in health status are less pronounced but also worth noticing, and the gradient reflects a pattern of queuing. In relative terms, prevalence of stunting in children in the poorest households is 56% higher than that in the richest households. Similarly, women in the poorest quintile are 71% more likely to be underweight than those in the richest quintile. These data show that households in quintile 2 are worse off in comparison to households in the poorest quintile, in terms of coverage of skilled birth attendance and prevalence of stunting in children. Figure 4.29 depicts the rural-urban patterns for four indicators.
Figure 4.29  Selected Indicators by Place of Residence, Comoros, DHS 1996

The figure shows that rural areas are at a clear disadvantage in all four indicators depicted. For example, skilled personnel attend to a much higher proportion of births in urban areas, and current use of modern contraception is 58% higher in urban areas than in rural areas. Similarly, the prevalence of women experiencing underweight is higher in rural areas. The same is true of prevalence of stunting in children – although the relative difference between urban and rural areas is smaller for this indicator. Figure 4.30 shows four indicators by education of the mother.

Figure 4.30  Selected Indicators by Education Level, Comoros, DHS 1996
Skilled personnel assist most women with at least secondary education (83%) during childbirth, compared to 41% of women with no education. Similarly, 11% of women without education and with expressed need for contraception use modern contraception, compared to 24% in the more educated group. The prevalence of stunting in children is also higher among the uneducated. Interestingly, however, the data show that the prevalence of underweight women is the same across educational groups.

4.7 Congo (Republic of)

The DHS 2005 data were used to assess inequities in health and access to health services in the Republic of Congo. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Congo. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, prevalence of underweight women, use of bednets by pregnant women, proportion of births attended to by skilled health personnel, and proportion of women with an expressed need for contraception using some form of modern contraception. Figure 4.31 shows infant and under-five mortality stratified by wealth quintiles, place of residence, educational achievement and sex of the child.

Figure 4.31  Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Congo, DHS 2005
The mortality gradient shows that in 2005 households in the poorest quintile experience a 65% higher infant mortality and a 74% higher under-five mortality rate than households in the richest quintile. There is also an association between mortality and mother’s level of educational attainment. Though infant mortality among children whose mothers have no formal education and mothers with some primary education is about the same, children whose mothers have at least some secondary education experience a 50% lower mortality rate. Under-five mortality shows a different pattern with clear differences across all educational categories. Children born to mothers with no formal education have a 21% higher mortality rate than children born to mothers with some primary education and a 91% higher mortality rate than children born to mothers with some secondary education.

Similarly, rural area residents experience 67% more infant mortality and 49% more under-five mortality than urban dwellers. Consistent with the evidence in other countries of the Region, the infant mortality rates for boys and girls are very similar (around 75 per 1000 live births) though under-five mortality for males is almost 5% higher than for females. Figure 4.32 shows six indicators, stratified by wealth quintile.

Figure 4.32  Selected Indicators by Wealth Quintile, Congo, DHS 2005

Members of households in the wealthiest quintile are two times more likely to receive DPT3 vaccines and 60% more likely to be attended to by skilled health personnel during childbirth compared to members of the poorest households. Women in the poorest quintile are nearly 80% more likely to be underweight compared to those in the richest quintile. Also, pregnant women in the richest quintile are about 1.3 times more likely to use a bednet than those in the poorest quintile. However, women in households in the middle quintiles (quintiles 3 and 4) are less likely to use bednets compared to those in the poorest quintile. The proportion of stunting of children in the poorest households is 50% higher than those in the richest households. Additionally, women in the poorest quintile are more than two times more likely to express unmet need for contraception compared to those in the richest quintile. Figure 4.33 depicts the rural-urban patterns for six indicators.
The figure shows that rural areas are at a disadvantage in all six indicators depicted. For example, a significantly higher proportion (76% more) of children living in urban areas receives DPT3 vaccines compared to those living in rural areas. In addition, births in urban areas are attended to more frequently (31% more) by skilled personnel; similarly, a lower proportion (16% less) of pregnant women in rural areas use bednets and modern contraception, compared to their urban counterparts. The same is true of children who experience stunting – the proportion is higher (27% more) in rural areas compared with urban areas. The prevalence of underweight women is only marginally higher in rural areas. Figure 4.34 depicts the patterns of the distribution of six indicators by education of the mother.
DPT3 coverage is almost three times higher for children born to mothers with at least some secondary education than for those born to mothers with no formal education. Similarly, skilled personnel assist 93% of women with at least some secondary education during childbirth compared to only 63% of women with no education. Moreover, only 7% of women without education and with expressed need for contraception use modern contraception compared to 21% in the more educated group. Additionally, the proportion of children who experience stunting is higher (61% more) among children whose mothers have no education compared to those whose mothers have at least some secondary education. The prevalence of underweight women, however, does not follow the aforementioned pattern, as underweight is relatively consistent across all groups, and only marginally lower among the most educated group.

4.8 Côte d’Ivoire

The DHS 1998 data were used to assess inequities in health and access to health services in Côte d’Ivoire. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Côte d’Ivoire. The indicators assessed include infant mortality, under-five mortality, coverage of DPT3 vaccination, stunting in children, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.35 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 1998 households in the poorest quintile experience two times more infant mortality than households in the richest quintile and 2.3 times greater under-five mortality. There are inequities associated with differences in the education level of the mother. Though the differences in infant mortality between children born to mothers with no formal education and mothers with some primary education is marginal, children born to mothers with at least some secondary education experience a 50% lower mortality rate. Under-five mortality shows the same pattern with a large difference between the first two educational categories and the third. Children born to mothers with no formal education or with some primary education have a mortality rate which is almost 2.5 times higher than children born to mothers with some secondary education.

Similarly, rural area residents experience 35% more infant mortality and 50% more under-five mortality than urban dwellers. The infant mortality rate for boys is 31% higher than for girls and under-five mortality for males is almost 30% higher than for females. A higher mortality rate for boys than girls is consistent with evidence from other countries of the Region. Figure 4.36 shows five indicators, stratified by wealth quintile.
Except for prevalence of underweight women, all indicators show a consistent social gradient across household wealth quintiles. Members of households in the wealthiest quintile are more than three times more likely to receive DPT3 vaccines and more than five times more likely to have skilled birth attendance compared to those of households in the poorest quintile. The proportion of stunting of children in poor households is almost three times higher than those in the richest households. Women in the poorest quintile are almost six times more likely to express unmet need for contraception compared to those in the richest quintile. Although the absolute difference is small (four percentage points), women in the poorest quintile are 50% more likely to be underweight compared to those in the richest quintile. Figure 4.37 depicts the rural-urban patterns for five indicators.
Figure 4.37  Selected Indicators by Place of Residence, Côte d’Ivoire, DHS 1998

The figure shows that rural areas are at a disadvantage in all five indicators depicted. For example, a significantly higher proportion (68% more) of children living in urban areas receive DPT3 vaccines compared to those living in rural areas; also births in urban areas are attended to more frequently (almost 1.5 times more) by skilled personnel. The same is true of children who experience stunting – the proportion is higher (61% more) in rural areas compared with urban areas. The prevalence of underweight women in rural areas is also higher than in urban areas. Women in rural areas are twice as likely to express unmet need for contraception compared to those in urban areas. Figure 4.38 depicts the patterns of distribution of five indicators by education level of the mother, all but one showing a consistent social gradient.
DPT3 coverage is more than two times higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 84% of women with at least some secondary education during childbirth, while skilled health personnel assist only 38% of women with no education (2.2 times less). Moreover, only 9% of women without education and with expressed need for contraception use a modern contraception method, compared to 35% in the more educated group. The same is true of children who experience stunting – the proportion is two times higher for children born to uneducated mothers compared with those born to mothers with at least some secondary education. The prevalence of underweight women, however, does not follow the aforementioned pattern, as underweight is only marginally lower among the most educated group.

### 4.9 Ethiopia

The data used to assess inequities in health and access to health services in Ethiopia come from DHS 2005. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Ethiopia. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.39 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 2005 households in the poorest quintile experience a 43% higher infant mortality and 52% higher under-five mortality than households in the richest quintile. The patterns for both indicators of mortality, however, show little variation across the four poorest quintiles (roughly 80% of the households), depicting a pattern of mass deprivation. There is a consistent social gradient in mortality associated with differences in mother’s level of education. The infant mortality rate for children born to mothers with no formal education is twice higher than that of children born to mothers with at least some secondary education while the under-five mortality rate is more than 2.6 times higher. Similarly, rural area residents experience 34% more under-five mortality than urban dwellers; the difference is less for infant mortality, as it is 5% higher in rural areas than in urban areas. Consistent with the evidence in other countries of the Region, the infant mortality rate for boys is 35% higher than for girls and under-five mortality for males is almost 22% higher than for females. Figure 4.40 shows six indicators, stratified by wealth quintile.
Members of households in the wealthiest quintile are more than 2.7 times more likely to receive DPT3 vaccines and almost twenty times more likely to be attended to by skilled health personnel during childbirth compared to households in the poorest quintile (in fact, for the first three quintiles, skilled birth attendance is virtually non-existent, and reflects a pattern of mass deprivation). There exists a high prevalence of underweight women across all households, with women in the richest households only slightly better off compared to those in the poorest households (six percentage points), indicating a pattern of mass deprivation in this area. Fifty percent of children in the poorest and in the next poorest (quintile 2) households experience stunting, which is 39% higher than those in the richest households. Women from the richest quintile are almost 5.5 times more likely to use modern contraception compared to those in the poorest quintile. Additionally, the use of bednets by pregnant women is more than seven times higher in the richest quintile than in the poorest one. Again, this indicator shows a pattern of mass deprivation as the poorest four quintiles show little difference and a very low level to non-existent use of bednets. Figure 4.41 depicts the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage for all six indicators depicted. For example, a significantly higher proportion (almost 3 times more) of children living in urban areas receives DPT3 vaccines compared to those living in rural areas. Skilled personnel attend to very few women giving birth in rural areas (3%). Skilled personnel attend less than half of all births in urban areas, yet this is almost 15 times greater than in rural areas. The proportion of children who experience stunting is higher (50% more) in rural areas compared to urban areas. The prevalence of underweight women in rural areas is 42% higher than in urban areas. Women with unmet need for contraception are also more in rural areas (185% more). The use of bednets by pregnant women in rural areas is almost non-existent in comparison to women in urban areas (eleven percentage points). Figure 4.42 depicts the patterns of distribution of six indicators by education level of the mother.
DPT3 coverage is more than 2.5 times higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 58% of women with at least some secondary education during childbirth compared to only 2% of women with no education. Moreover, only 12% of women without education and with expressed need for contraception use modern contraception compared to 44% in the more educated group (3.5 times less likely in rural compared to urban areas). Similarly, children born to mothers with no formal education experience stunting two times more than those born to mothers with at least some secondary education. The prevalence of underweight is more than 40% higher among women with no formal education or with some primary education, compared to the most educated group.

4.10 Gabon

The data used to assess inequities in health and access to health services in Gabon come from DHS 2000. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Gabon. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.43 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality data from 2000 show that households in the poorest quintile experience 21% higher infant mortality and 56% higher under-five mortality compared to households in the richest quintile. Yet the patterns across households grouped by wealth, for both indicators of mortality, are not consistent, as quintiles 2 and 4 show higher rates than the poorest quintile, quintile 3 and the least poor quintile. However, a more consistent association between inequities in mortality and mother’s level of education exists, particularly for under-five mortality. Infant mortality for children born to mothers with no formal education is 29% higher than that for children born to mothers with at least some secondary education. Under-five mortality for children born to mothers with no formal education is 56% higher than for children born to mothers with some secondary education.

Although rural residents experience 21% greater under-five mortality than urban dwellers, there is only a four percentage point difference in infant mortality, in favour of urban areas. Consistent with the evidence in other countries of the Region, the infant mortality rate for boys is 59% higher than for girls and under-five mortality for males is almost 26% higher than for females. Figure 4.44 shows five indicators, stratified by wealth quintile.
Overall, data show a systematic pattern of queuing across wealth groups for many indicators. Members of households in the wealthiest quintile are three times more likely to receive DPT3 vaccines, although children in households in quintile 4 are better off (five percentage points). Women living in the poorest households are more than twice as likely to be underweight compared to those in the richest households, with a difference of five percentage points. Women in the poorest households are 2.6 times more likely to express unmet need for contraception compared to those in the richest households. With absolute coverage levels high compared to many other countries in the Region, women in the richest households are 40% more likely to have deliveries attended to by skilled health personnel compared to those in the poorest households. The proportion of children experiencing stunting in the poorest households is almost two times higher than those in the richest households. Figure 4.45 depicts the rural-urban patterns for the five aforementioned indicators.
Figure 4.45  Selected Indicators by Place of Residence, Gabon, DHS 2000

The figure shows that rural areas are at a disadvantage in all five indicators depicted. For example, more than twice as many children living in urban areas receive DPT3 vaccines compared to those living in rural areas. Reflecting high rates of coverage based on 2000 data, births are attended to more frequently (32% more) by skilled personnel in urban areas than in rural areas. The proportion of children who experience stunting is higher (70% more) in rural areas compared to urban areas. The prevalence of underweight women in rural areas is slightly higher (two percentage points) than in urban areas. Women with unmet need for contraception are also two times more in rural areas than in urban areas. Figure 4.46 depicts the patterns of distribution of five indicators by education of the mother.
Based on the 2000 data analysed, a consistent association does not exist between educational achievement and some indicators. Further investigation is required to determine if the appropriateness of the standardized educational categories in Gabon or if education is not associated with inequalities in coverage or outcomes analysed. For example, DPT3 coverage is higher (22%) for children born to mothers with no formal education than for children born to mothers with at least some secondary education. For skilled birth attendance, overall coverage is high: skilled personnel assist 94% of women with at least some secondary education during childbirth, whereas 82% to 83% of women with no formal education or some primary education is assisted by skilled health personnel. Women with at least some secondary education are three times more likely to use modern contraception compared to women with no formal education. Children born to mothers with no or some primary education experience stunting more (about 1.6 times) than children born to mothers with at least some secondary education. The prevalence of underweight women is slightly lower (three to four percentage points) among the most educated group, compared to the two other education groups.

4.11 Ghana

DHS 2003 data were used to assess inequities in health and access to health services in Ghana. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.47 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 2003 households in the poorest quintile experience a similar infant mortality as households in the richest quintile, while for under-five mortality households in the poorest quintile suffered more than 30% higher mortality than those in the richest quintile. There are inequities in mortality associated with differences in mother’s level of education. Under-five mortality for children born to mothers with no formal education is 45% higher than that for children born to mothers with at least some secondary education. The pattern for infant mortality is, however, less clear than the pattern for under-five mortality. Across household wealth quintiles, infant mortality is approximately at the same level. However, rural area residents experience 32% more infant mortality and 28% more under-five mortality than urban dwellers. The infant mortality rate for boys is 26% higher than for girls, while under-five mortality is only 3% higher for boys. This is consistent with the evidence in other countries of the Region that infant and under-five mortality rates for boys are higher than for girls. Figure 4.48 shows six indicators, stratified by wealth quintile.
Members of households in the wealthiest quintile are 34% more likely to receive DPT3 vaccines than households in the poorest quintile, although the pattern across this wealth gradient is not consistent. Differences are substantially higher for skilled birth attendance, as women in the richest households are almost 4.8 times more likely to be attended to by skilled personnel during childbirth compared to the poorest households. Prevalence of underweight women across households by wealth quintile documents a clear gradient: women in the poorest quintile are almost three times as likely to be underweight compared to those in the richest quintile. A consistent gradient is also found for the proportion of children experiencing stunting, with children in the poorest households almost three times more likely to be stunted than those in the richest households. Women in the poorest quintile are 2.8 times more likely to express unmet need for contraception compared to those in the richest quintile. However, the use of bednets by pregnant women is 3.3 times more frequent in the poorest households than in the richest ones. Figure 4.49 depicts the rural-urban patterns for the six aforementioned indicators.
Figure 4.49  Selected Indicators by Place of Residence, Ghana, DHS 2003

The figure shows that rural areas are at a disadvantage in all five indicators depicted. For example, a higher proportion (14%) of children living in urban areas receive DPT3 vaccines compared to those living in rural areas; also births in urban areas are attended to much more frequently (almost 2.6 times more) by skilled personnel. The same is true of children experiencing stunting – the proportion is higher (70% more) in rural areas compared to urban areas. The prevalence of underweight women in rural areas is twice as high as it is in urban areas. The prevalence of women with unmet need for contraception is also higher in rural areas (47%). However, the use of bednets by pregnant women is twice as frequent in rural areas than in urban ones. Figure 4.50 depicts the patterns of distribution of six indicators, by education of the mother.
DPT3 coverage is almost 36% higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 69% of women with at least some secondary education during childbirth compared to only 30% of women with no education. Moreover, only 13% of women without formal education and with expressed need for contraception use modern contraception, compared to 28% in the most educated group. The same is true of children experiencing stunting – the proportion is higher (58% more) for children born to mothers without formal education compared with those born to mothers with at least some secondary education. The prevalence of underweight women is almost twice as high among the least educated group compared to the most educated one. Women in the middle education group are least likely to use bednets.

**Trends in population averages and wealth inequities**

Table 4.5 summarizes the trends of health status and health system indicators. For health status indicators, the findings indicate that, in general, there was an improvement in average infant and under-five mortality and prevalence of underweight women between 1993 and 2003. However, the prevalence of stunting in children and women overweight worsened. For health systems, the survey data show a consistent improvement for all of the indicators over the ten-year period.
Table 4.5  Trends in population averages and household wealth inequities for selected health and health care indicators, Ghana, DHS 1993, 1998 and 2003

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th></th>
<th></th>
<th>Ratio*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>66.4</td>
<td>56.7</td>
<td>64.3</td>
<td>1.9</td>
<td>2.7</td>
<td>1.0</td>
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<tr>
<td>Under-five mortality</td>
<td>119.4</td>
<td>107.6</td>
<td>111.2</td>
<td>2.1</td>
<td>2.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>25.9</td>
<td>25.9</td>
<td>29.4</td>
<td>2.5</td>
<td>2.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>11.7</td>
<td>11.2</td>
<td>9.3</td>
<td>2.4</td>
<td>4.5</td>
<td>2.8</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>12.6</td>
<td>16.0</td>
<td>25.1</td>
<td>7.0</td>
<td>8.5</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>54.2</td>
<td>64.6</td>
<td>74.8</td>
<td>2.1</td>
<td>1.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>43.7</td>
<td>44.5</td>
<td>47.4</td>
<td>5.9</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Current use of modern contraception for women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with expressed need for contraception</td>
<td>12.7</td>
<td>16.1</td>
<td>22.5</td>
<td>6.2</td>
<td>2.4</td>
<td>2.8</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes between 1998 and 2003, the indicators present different patterns in terms of inequity trends over the five-year period. The relative gaps in coverage of skilled birth attendance and use of modern contraception for women with expressed need for contraception exhibit an increase or no improvement in inequity, whereas a decrease in inequity is documented for the rest of the indicators.

Table 4.6 summarizes trends focusing on the most recent changes between 1998 and 2003 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.1

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Table 4.6  Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2003), Ghana

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving</td>
<td>A. Best outcome</td>
<td>- DPT3 coverage</td>
<td>B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of underweight among women</td>
<td>- Delivery by skilled birth attendants</td>
</tr>
<tr>
<td></td>
<td>C.</td>
<td>- Infant mortality rate</td>
<td>D. Worst outcome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Under-five mortality rate</td>
<td>- Use of modern contraception for women with expressed need for contraception</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Stunting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of overweight among women</td>
<td></td>
</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. DPT3 coverage and prevalence of underweight women represent this pattern. Figure 4.51 illustrates this pattern in DPT3 coverage focusing on the most recent changes between 1998 and 2003.

It is possible to see a widening of the relative gap even with improving population average (cell B). This pattern could result when the richest group improves faster than the poorest group. This is the case in coverage of skilled birth attendance and use of modern contraception for women with expressed need for contraception (Figure 4.52): in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a little bit. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). Infant mortality rate (Figure 4.53) falls in this category along with under-five mortality rate, stunting in children and prevalence of women overweight.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average although this situation was not evident in Ghana based on the indicators used in the analyses.
Figure 4.51  Trends in DPT3 Vaccination Coverage by Wealth Quintile, Ghana, DHS 1993, 1998 and 2003

Figure 4.52  Trends in Use of Modern Contraception for Women with Expressed Need for Contraception by Wealth Quintile, Ghana, DHS 1993, 1998 and 2003
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequality for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint key factors that are associated with the observed inequality in access to skilled birth attendance.

Figure 4.54 shows that wealth is by far the most important underlying cause, accounting for more than 30% of the inequality in access to skilled birth attendance. Health system factors taken together account for more than 21% and therefore also contribute significantly to inequality in access to skilled birth attendance. For Ghana, these results imply that policies and interventions that address socioeconomic position as well as improvements in health systems are both needed to reduce the inequities documented.
**4.12 Guinea**

The data used to assess inequities in health and access to health services in Guinea come from DHS 2005. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Guinea. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.55 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.

**Figure 4.55  Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Guinea, DHS 2005**
The mortality gradient shows that in 2005 households in the poorest quintile experience a 47% higher infant mortality and a 66% under-five mortality than households in the richest quintile. The patterns for both indicators of mortality, however, show little variation in mortality rates across the four poorest quintiles (roughly 80% of the households), indicating that different levels of household wealth within the country are not highly associated with differences in infant and child mortality, except for those in the richest households. Similarly, inequities in mortality associated with mother’s level of education show that children of women with no formal education or some primary education experience similar and lower levels of mortality in comparison to those whose mothers have at least some secondary education. Infant mortality for children born to mothers with no formal education is about a third higher than that for children born to mothers with at least some secondary education. Under-five mortality shows greater differences. Children born to mothers with no formal education have a mortality rate which is more than two times higher than that of children born to mothers with some secondary education.

Similarly, rural area residents experience 41% more under-five mortality and 26% more infant mortality than urban dwellers. The infant mortality rate for boys is 27% higher than for girls and under-five mortality for males is almost 13% higher than for females, which is similar to other countries in the Region. Figure 4.56 shows six indicators, stratified by wealth quintile.

**Figure 4.56  Selected Indicators by Wealth Quintile, Guinea, DHS 2005**

Members of households in the wealthiest quintile are more than 66% more likely to receive DPT3 vaccines and more than 5.3 times more likely to be attended to by skilled health personnel compared to the poorest quintile. In contrast, there is little variation in the proportion of underweight women across quintiles. The proportion of stunting in children in poor households is 79% higher than those in the richest households. Women in the poorest quintile are 5.25 times more likely to express unmet need for contraception compared to those in the richest quintile. Except for the poorest quintile, the use of bednets by pregnant women is similar across quintiles. Figure 4.57 depicts the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage in five of the indicators depicted. For example, a higher proportion (29% more) of children living in urban areas receive DPT3 vaccines compared to those living in rural areas; also births in urban areas are attended to much more frequently (almost 3.1 times more) by skilled personnel. The same is true of children experiencing stunting – the proportion is higher (65% more) in rural areas compared to urban areas. The prevalence of women experiencing underweight in rural areas is 18% higher than in urban areas. The prevalence of women with unmet need for contraception is also higher in rural areas (three times higher). However, the use of bednets in rural areas is two percentage points higher than in urban areas. Figure 4.58 depicts the patterns of distribution of six indicators by education of the mother.
DPT3 coverage is more than 53% higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 85% of women with at least some secondary education during childbirth compared to only 33% of women with no education. Moreover, only 6% of women without formal education and with expressed need for contraception use modern contraception compared to 23% in the most educated group. The same is true of children experiencing stunting – the proportion is higher (80%) for children born to uneducated mothers compared to those born to mothers with at least some secondary education. The prevalence of underweight women and the use of bednets by pregnant women do not follow the aforementioned pattern, as underweight is similar for all educational categories, and women with some secondary education are less likely than the other two groups to report use of bednets while pregnant.

4.13 Kenya

DHS 2003 data were used to assess inequities in health and access to health services in Kenya. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Kenya. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.59 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 2003 households in the poorest quintile experience a 44% higher infant mortality and 77% higher under-five mortality than households in the richest quintile. However, infant mortality in the three poorest quintiles (60% of the population) are relatively similar. There are also inequities in mortality associated with education level of the mother, although a clear gradient does not exist. The prevalence of infant mortality for children born to mothers with no formal education is 8% higher than that for children born to mothers with at least some secondary education. Under-five mortality shows similar differences. Children born to mothers with no formal education have a mortality rate which is more than 22% higher than children born to mothers with some secondary education. In both cases, however, the highest mortality rate is among children born to mothers with some primary education. Similarly, rural area residents experience 31% more infant mortality and 28% more under-five mortality than urban dwellers. The infant and under-five mortality rates for boys are around 30% higher than those for girls, similar to what is documented across the Region. Figure 4.60 shows six indicators, stratified by wealth quintile.
Members of households in the wealthiest quintile are only slightly (6%) more likely to receive DPT3 vaccines than those of household in the poorest quintile, though the difference is higher (37%) when compared to the third quintile. Differences are clearly associated with the wealth gradient for skilled birth attendance, as women in the richest households are almost 5.6 times more likely to be attended to by skilled personnel during childbirth compared to those in the poorest households. Women in the poorest quintile are 6.2 times more likely to be underweight compared to those in the richest quintile. The proportion of stunting in children in the poorest households is 137% higher (almost 2.4 times more) than those in the richest households. Women in the poorest quintile are four times more likely to express unmet need for contraception compared to those in the richest quintile. The use of bednets by pregnant women is eight times more frequent in the richest households than in the poorest ones. Figure 4.61 depicts the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage in most of the indicators depicted. However, rural areas fare better than urban ones for DPT3 vaccine coverage. Specifically, a higher proportion (28% more) of children living in rural areas receives DPT3 vaccines compared to those living in urban areas. However, the prevalence of women experiencing underweight in rural areas is 2.3 times higher than in urban areas. Births in urban areas are attended to more frequently (more than twice as frequent) by skilled personnel. The same is true of children experiencing stunting – the proportion is higher (33% more) in rural areas compared to urban areas. Women with unmet need for contraception are also more in rural areas (40% more). Less than half of pregnant women in rural areas are likely to sleep under a bednet compared to their urban counterparts. Figure 4.62 depicts the patterns of distribution of six indicators by education of the mother.
Figure 4.62  Selected Indicators by Education Level, Kenya, DHS 2003

DPT3 coverage is almost 44% higher for children born to mothers with primary or some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 54% of women with at least some secondary education during childbirth compared to only 16% of women with no education. Moreover, only 9% of women without education and with expressed need for contraception use modern contraception compared to 40% in the more educated group (more than four times greater). The same is true of children experiencing stunting – the proportion is higher (37% more) for children born to uneducated mothers compared with those born to mothers with at least some secondary education. The prevalence of underweight women is three times higher among the least educated group than the most educated one. Finally, the use of bednets by pregnant women is 70% higher among women in the richest households than women in the poorest ones.

**Trends in population averages and wealth inequities**

Table 4.7 summarizes the trends of health status and health systems indicators. The findings show that health status worsened for all indicators except childhood stunting between 1993 and 2003. For health system indicators, the findings indicate an improvement in the national averages for current use of modern contraception and a worsening for skilled birth attendance and DPT3 coverage.
Table 4.7  Trends in Population Averages and Household Wealth Inequities for Selected Health and Health Care Indicators, Kenya, DHS 1993, 1998 and 2003

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>61.7</td>
<td>73.7</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>96.1</td>
<td>111.5</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>33.3</td>
<td>33.5</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>10.0</td>
<td>11.7</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>14.0</td>
<td>14.9</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>65.4</td>
<td>51.2</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>45.1</td>
<td>44.5</td>
</tr>
<tr>
<td>Current use of modern contraception for women</td>
<td>31.4</td>
<td>32.0</td>
</tr>
<tr>
<td>with expressed need for contraception</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes between 1998 and 2003 the different indicators present different patterns in terms of inequity trends over the five-year period. The relative gaps in coverage of DPT3 and skilled birth attendance and the prevalence of underweight women exhibit an increase in inequity, whereas a slight decrease in inequity is documented for the rest of the indicators.

Table 4.8 summarizes trends focusing on the most recent changes between 1998 and 2003 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.¹

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### Table 4.8  Changes in inequities and population averages focusing on the most recent changes (between DHS 1998 and 2003), Kenya

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
</table>
| **Improving**      | A. *Best outcome* | - Use of modern contraception for women with expressed need for contraception  
                     - Stunting | B. | - DPT3 coverage |
|                    | **Worsening/status quo** | C. | | D. *Worst outcome* |
|                    | | - Infant mortality rate  
                     - Under-five mortality rate  
                     - Prevalence of overweight among women | | - Delivery by skilled birth attendants  
                     - Prevalence of underweight among women |

The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. Use of modern contraception for women with expressed need for contraception and stunting in children represent this pattern. It is worth noting that for use of modern contraception, the inequity trend is different between all women and women with expressed need for contraception. Figure 4.63 illustrates this pattern in stunting in children focusing on the most recent changes between 1998 and 2003.

It is possible to see a widening of the relative gap even with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case in DPT3 coverage: in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a little bit. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). Both the infant and under-five mortality rates and women overweight exhibit this pattern.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: skilled birth attendance and underweight women (Figure 4.64) fall in this category based on the data available from national surveys.
Figure 4.63  Trends in Stunting in Children by Wealth Quintile, Kenya, DHS 1993, 1998 and 2003

Figure 4.64  Trends in Underweight Women by Wealth Quintile, Kenya, DHS 1993, 1998 and 2003
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequality for potential improvement. The results from this type of analysis, together with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance. Decomposition thus shows key factors for reducing inequities, if addressed. Figure 4.65 below illustrates that policies and interventions that address socioeconomic position as well as improvements in health systems are both needed to reduce socioeconomic inequity in access to skilled birth attendance.

Figure 4.65  Factors Contributing to Inequalities in Skilled Birth Attendance, Kenya, DHS 2003

Wealth is by far the most important underlying cause, accounting for nearly 35% of the inequality in access to skilled birth attendance. Health system factors taken together account for more than 18% and therefore also contribute significantly to inequality in access to skilled birth attendance. For Kenya, these results imply that policies and interventions that address socioeconomic position as well as improvements in health systems are both needed to reduce the inequities documented.

4.14 Lesotho

The 2004 DHS data were used to assess inequities in health and access to health services in Lesotho. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Lesotho. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.66 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 2004 households in the four poorest quintiles (80% of the population) have similar levels of infant mortality, with an 18% difference between the poorest and richest quintiles. The same holds true for under-five mortality rate. In both cases, data show that differences across quintiles are relatively small. There are, however, inequities in mortality associated with differences in the education level of the mother. Though the differences in infant mortality between children born to mothers with at least some primary education and mothers with some secondary schooling is small, children born to mothers with no formal education experience a 95% higher mortality rate. Under-five mortality shows the same pattern with clear differences between women with no formal education and those with primary or some secondary education.

Similarly, rural area residents experience 11% more infant mortality than urban dwellers. However, under-five mortality is higher (6%) among the latter. The infant mortality rate for boys is 7% higher than the rate for girls and under-five mortality for males is almost 16% higher than for females, that is less than the difference documented widely in most other countries in the Region. Figure 4.67 shows five indicators stratified by wealth quintile.
Four of the five indicators show a consistent gradient across household wealth quintiles. Members of households in the wealthiest quintile are over 18% more likely to receive DPT3 vaccines and over 177% more likely to be attended to by skilled health personnel during childbirth compared to members of households in the poorest quintile; women in the poorest quintile are 2.5 times more likely to be underweight compared to those in the richest quintile. The proportion of stunting in children in poor households is almost 90% higher than those in the richest households. Women in the poorest quintile are over three times more likely to express unmet need for contraception compared to those in the richest quintile. Figure 4.68 depicts the rural-urban patterns for five indicators.
The figure shows that rural areas are at a clear disadvantage in at least four indicators depicted. For example, births in urban areas are attended to more frequently (72% more) by skilled personnel. The prevalence of women experiencing underweight in rural areas is about twice as high as in urban areas. However, such differences are not large for DPT3 vaccination, as coverage in urban areas is only marginally higher than coverage in rural areas based on the survey data. For children experiencing stunting in rural areas, the proportion is moderately higher (12% more) compared to urban area. Figure 4.69 depicts the patterns of distribution of five indicators by education of the mother.
DPT3 coverage is 30% higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, 64% of women with at least some secondary education are assisted by skilled personnel during childbirth, compared to only 21% of women with no education. Moreover, only 9% of women without education and with expressed need for contraception use modern contraception compared to 44% in the more educated group. The same is true of children experiencing stunting — the proportion is higher (43% more) for children born to uneducated mothers compared with those born to mothers with at least some secondary education. The prevalence of underweight women who have no formal education or primary education is similar, about twice as high than it is in the most educated group.

### 4.15 Madagascar

The 2003-2004 DHS data were used to assess inequities in health and access to health services in Madagascar. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Madagascar. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with expressed need for contraception using some form of modern contraception. Figure 4.70 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 2003-2004 households in the poorest quintile experience a 100% higher infant mortality and 135% higher under-five mortality than households in the richest quintile. There are also important inequities in mortality associated with the education level of the mother. Infant mortality for children born to mothers with no formal education is 71% higher than that for children born to mothers with at least some secondary education. Under-five mortality shows the same trend. Children born to mothers with no formal education have a mortality rate which is more than 85% higher than that of children born to mothers with some secondary education.

Similarly, rural area residents experience 63% more under-five mortality and 75% more infant mortality than urban dwellers. The infant mortality rate for boys is 32% higher than that for girls and under-five mortality for males is 19% higher than for females. Figure 4.71 shows six indicators, stratified by wealth quintile.
A consistent gradient exists in five of the indicators. Members of households in the wealthiest quintile are more than 2.2 times more likely to receive DPT3 vaccines and almost five times more likely to be attended to by skilled health personnel during childbirth compared to those in the poorest quintile; and women in the poorest quintile are 3.2 times more likely to be underweight compared to those in the richest quintile. The proportion of stunting in children in the poorest households is 50% higher than those in the richest households. Women in the poorest quintile are 3.5 times more likely to express unmet need for contraception compared to those in the richest quintile. The use of bednets by pregnant women is, however, comparable across quintiles. Figure 4.72 depicts the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage in all six indicators depicted. For example, a higher proportion (27% more) of children living in urban areas receive DPT3 vaccines compared to those living in rural areas; also births in urban areas are attended to more frequently (77% more often) by skilled personnel. The same is true of children experiencing stunting – the proportion is higher (20% more) in rural areas compared to urban areas. The prevalence of women experiencing underweight in rural areas is around 40% higher than in urban areas. The number of women with unmet need for contraception is also higher in rural areas (53% more). Figure 4.73 depicts the patterns of distribution of six indicators by education level of the mother.
DPT3 coverage is almost 2.5 times higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 82% of women with at least some secondary education during childbirth compared to only 22% of women with no education. Moreover, only 7% of women without education and with expressed need for contraception use modern contraception, compared to 29% in the more educated group. For children experiencing stunting, the proportion is higher (29% more) for children born to mothers with no education or primary education compared with those born to mothers with at least some secondary education. The prevalence of underweight women is more than two times higher among the least educated group compared to the most educated one.

**Trends in population averages and wealth inequities**

Table 4.9 summarizes the trends of health status and health system indicators. For health status indicators, the findings indicate consistent improvements between 1992, 1998 and 2003/04 of population averages for under-five mortality and stunting in children and an overall improvement for infant mortality. Underweight and overweight prevalence for women is only available for 1998 and 2003/04. During this interval, the prevalence of underweight women dropped slightly, whereas the prevalence of women overweight increased. For health system indicators, the survey data shows an improvement in the national average for use of modern contraception for women with expressed need for contraception; a worsening for skilled birth attendance; and a worsening for DPT3 vaccination coverage.
Table 4.9 Trends in population averages and household wealth inequities for selected health and health care indicators, Madagascar, DHS 1992, 1997 and 2003/04

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th></th>
<th></th>
<th>Ratio*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health status</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>93.0</td>
<td>96.3</td>
<td>57.8</td>
<td>1.6</td>
<td>1.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>162.8</td>
<td>159.2</td>
<td>93.9</td>
<td>1.6</td>
<td>1.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>54.1</td>
<td>48.3</td>
<td>47.3</td>
<td>1.3</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>20.2</td>
<td>19.1</td>
<td>19.1</td>
<td>2.1</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>3.7</td>
<td>7.0</td>
<td>7.0</td>
<td>4.5</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Health systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>43.1</td>
<td>38.6</td>
<td>42.7</td>
<td>1.9</td>
<td>2.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>56.7</td>
<td>47.6</td>
<td>45.7</td>
<td>2.2</td>
<td>3.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Current use of modern contraception for women</td>
<td>6.5</td>
<td>11.1</td>
<td>21.6</td>
<td>18.0</td>
<td>7.6</td>
<td>3.6</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes between 1997 and 2003/04, the different indicators present different patterns in terms of inequity trends over the 6-7 year period. The relative gaps in use of modern contraception for women with expressed need for contraception and DPT3 coverage exhibit a decrease in inequity, whereas an increase in inequity is documented for the remaining indicators.

Table 4.10 summarizes trends focusing on the most recent changes between 1997 and 2003/04 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.¹

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Table 4.10  Changes in inequities and population averages focusing on the most recent changes (between DHS 1997 and 2003/04), Madagascar

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving</td>
<td>A. Best outcome</td>
<td>- DPT3 coverage</td>
<td>- Infant mortality rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use of modern contraception for women with expressed need for contraception</td>
<td>- Under-five mortality rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Stunting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Prevalence of underweight among women</td>
</tr>
<tr>
<td>Worsening/status quo</td>
<td>C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Worst outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delivery by skilled birth attendants</td>
<td>- Prevalence of overweight among women</td>
</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. DPT3 coverage and use of modern contraception for women with expressed need for contraception represent this pattern. Figure 4.74 illustrates this pattern in DPT3 coverage focusing on the most recent changes between 1997 and 2003/04.

It is possible to see a widening of the relative gap even with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case in both infant and under-five mortality rates, stunting in children and the prevalence of underweight women: in spite of improving national averages, the relative gap between the poorest and richest quintiles has widened slightly. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C), although this situation was not evident in Madagascar based on the indicators that were analysed.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: skilled birth attendance (Figure 4.75) falls in this category, along with the prevalence of women overweight.
Figure 4.74  Trends in DPT3 Vaccination Coverage by Wealth Quintile, Madagascar, DHS 1992, 1997 and 2003/04

Figure 4.75  Trends in Skilled Birth Attendance by Wealth Quintile, Madagascar, DHS 1992, 1997 and 2003/04
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequity for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.76 below shows that socioeconomic factors explain almost 80% of the inequality observed in access to skilled birth attendance, with wealth alone associated with 50% of the inequality observed. Health system factors account for about 20% and therefore contribute significantly to the socioeconomic inequality in skilled birth attendance. For Madagascar, these results imply that policies and interventions that address socioeconomic position as well as improvements in health systems are both needed to reduce the socioeconomic inequality documented.

Figure 4.76 Factors Contributing to Inequalities in Skilled Birth Attendance, Madagascar, DHS 2003

4.16 Malawi

The data used to assess inequities in health and access to health services come from Malawi’s Demographic and Health Survey, 2004. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Malawi. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception and use of antimalarial drugs during pregnancy. Figure 4.77 shows infant and under-five mortality stratified by household wealth quintile, place of residence, educational achievement of the women or mother, and sex of the child.
The data show that in 2004 households in the poorest quintile experience 1.6 times greater infant and under-five mortality than households in the richest quintile. The gradient by wealth quintile for both infant and under-five mortality reflects a pattern where the low and middle-wealth groups (Q2, Q3 and Q4) have closer mortality rates. There are also inequities in mortality associated with the level of educational achievement of the mother. Children born to mothers with no education or primary education are 1.3 times more likely to die before their first birthday than those born to mothers with secondary education or higher. Moreover, rural area residents experience 67% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.78 shows seven indicators, stratified by wealth quintile.
A consistent gradient across household wealth groups is clear for five indicators, particularly in terms of access to health services. For example, wealthier mothers are almost two times more likely to be assisted by skilled health personnel during delivery than the poorest mothers, and current modern contraception use is 1.6 times higher in the richest quintile than in the poorest quintile. Bednet use by pregnant women is more than three times higher for women in the richest households compared to those in the poorest households, with the richest women far better off than even those in the second richest quintile (Q4).

Prevalence of stunting in children is more than 50% for children in three-fifths of all households. A similar pattern holds for the prevalence of underweight women, which is around 10% for the bulk of the population. Figure 4.79 depicts the rural-urban patterns for seven indicators.
Figure 4.79  Selected Indicators by Place of Residence, Malawi, DHS 2004

The figure shows that rural areas are at a disadvantage in all indicators depicted, especially in indicators such as skilled birth attendance, use of bednets by pregnant women and prevalence of stunting in children. For example, relative to rural areas, the probability of having skilled birth attendance in urban areas is 1.6 times higher and use of bednets by pregnant women is 2.4 times higher in urban areas. Similarly, the prevalence of underweight women is twice as high in rural areas. The same pattern exists for children experiencing stunting – about one third higher in rural areas compared to urban areas. Figure 4.80 shows seven selected indicators by educational level of the mother.
Skilled personnel assist as much as 75% of women with at least secondary education during childbirth, compared to 43% of women with no formal education. Similarly, women with secondary education are 2.5 times more likely to use bednets during pregnancy, compared to women without formal education. In spite of relatively high coverage, the gradient by education of antimalarial drug use during pregnancy reflects important inequities. The proportion of children experiencing stunting is higher among children whose mothers have no formal education or primary education, in comparison to the most educated group. In contrast, the analysis suggests that the prevalence of underweight women is not associated with their level of education.

**Trends in population averages and wealth inequities**

Table 4.11 summarizes the trends of health status and health system indicators. The findings show an improvement for infant and under-five mortality rates and prevalence of stunting in children; a worsening for women overweight; and a slight improvement in the prevalence of underweight women between 1992 and 2004. For health system indicators, the survey data indicates an improvement in the national average for skilled birth attendance; a worsening for DPT3 coverage; and a remarkable improvement for use of modern contraception for women with expressed need for contraception.
Table 4.11 Trends in population averages and household wealth inequities for selected health and health care indicators, Malawi, DHS 1992, 2000 and 2004

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>134.6</td>
<td>103.7</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>233.8</td>
<td>188.5</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>49.2</td>
<td>49.0</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>9.4</td>
<td>8.7</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>9.0</td>
<td>11.8</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>80.8</td>
<td>73.9</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>55.2</td>
<td>55.7</td>
</tr>
<tr>
<td>Current use of modern contraception for women</td>
<td>9.0</td>
<td>29.0</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes between 2000 and 2004, the different indicators present different patterns in terms of inequity trends over the four-year period. The inequity in stunting and skilled birth attendance did not change between 2000 and 2004. However, the relative gaps in the use of modern contraception for women with expressed need for contraception and the prevalence of both underweight and overweight in women exhibit a decrease in inequity, whereas an increase in inequity is documented for the remaining indicators.

Table 4.12 summarizes trends focusing on the most recent changes between 2000 and 2004 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.1

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Table 4.12  Changes in inequities and population averages focusing on the most recent changes (between DHS 2000 and 2004), Malawi

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Improving</th>
<th>Worsening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Best outcome</td>
<td>Narrowing</td>
<td>- Delivery by skilled birth attendants - Infant mortality rate - Under-five mortality rate - Stunting</td>
<td></td>
</tr>
<tr>
<td>C.</td>
<td>Worsening</td>
<td>- Use of modern contraception for women with expressed need for contraception - Prevalence of underweight among women - Prevalence of overweight among women</td>
<td></td>
</tr>
<tr>
<td>D. Worst outcome</td>
<td>Widening/status quo</td>
<td>- DPT3 coverage</td>
<td></td>
</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time, although this situation was not evident in Malawi based on the indicators analysed.

It is possible to see a widening of the relative gap with improving population average (cell B). This pattern could result when the richest group improves faster than the poorest group. This is the case in the coverage of skilled birth attendance (Figure 4.81), both the infant and under-five mortality rates and stunting in children: in spite of improving national averages, the relative gap between the poorest and richest quintiles has slightly widened. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). Use of modern contraception for women with expressed need for contraception (Figure 4.82) and the prevalence of underweight and overweight women represent this pattern.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: DPT3 coverage (Figure 4.83) falls in this category.
Figure 4.81  Trends in Skilled Birth Attendance by Wealth Quintile, Malawi, DHS 1992, 2000 and 2004

Figure 4.82  Trends in Use of Modern Contraception for Women with Expressed Need for Contraception by Wealth Quintile, Malawi, DHS 1992, 2000 and 2004
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequity for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.84 shows that socioeconomic and related factors (wealth, education, etc.) are associated with almost 50% of the inequality in access to skilled birth attendance in Malawi in 2004. Health system factors taken together explain another 20% of the inequality. For Malawi, these results imply that policies and interventions that address both socioeconomic position and improvements in health systems are needed to reduce the inequity in access to skilled birth attendance.
4.17 Mali

The DHS 2001 data were used to assess inequities in health and access to health services in Mali. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Mali. The indicators assessed include infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended by skilled health personnel, and proportion of women with an expressed need for contraception using some form of modern contraception.

Figure 4.85 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The consistent mortality gradient shows that in 2001 households in the poorest quintile experience a 41% higher infant mortality and a 65% greater under-five mortality than households in the richest quintile. There are also inequities in mortality associated with educational level of the mother. Infant mortality for children born to mothers with no formal education is 78% higher than that for children born to mothers with at least some secondary education. Under-five mortality shows the same trend. Children born to mothers with no formal education have a mortality rate which is more than 2.2 times higher than children born to mothers with some secondary education.

Similarly, rural area residents experience 32% more under-five mortality and 22% more infant mortality than urban dwellers. The infant mortality rate for boys is 11% higher than for girls and under-five mortality for males is only 5% higher than for females. This is consistent with the evidence in other countries of the Region that infant and under-five mortality rates for boys are higher than those for girls. Figure 4.86 shows six indicators, stratified by wealth quintile.

Figure 4.86  Selected Indicators by Wealth Quintile, Mali, DHS 2001

Three indicators show a consistent gradient by household wealth quintiles. Members of households in the wealthiest quintile are more than 4.2 times more likely to receive DPT3 vaccines and almost six times more likely to be attended to by skilled health personnel compared to the poorest quintile. Although women in the poorest quintile are nearly 60% more likely to be underweight (six percentage points) compared to those in the richest quintile, the prevalence is relatively similar across 80% of households (excluding the poorest households). The proportion of stunting of children in the poorest households is more than twice higher than those in the richest households. Women in the poorest quintile are four times more likely to express unmet need for contraception compared to those in the richest quintile. The use of bednets by pregnant women is not strongly associated with household wealth, with a four percentage point difference between the richest and poorest quintiles. Figure 4.87 depicts the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage in all six indicators. For example, a significantly higher proportion (129% or more than twice) of children living in urban areas receive DPT3 vaccines compared to those living in rural areas; also births in urban areas are attended to much more frequently (three times more) by skilled personnel. The same is true of children experiencing stunting – the proportion is higher (83% more) in rural areas compared to urban areas. The prevalence of women experiencing underweight in rural areas is somewhat higher (two percentage points) than in urban areas, whereas women in rural areas are three times as likely to have unmet need for contraception. Figure 4.88 depicts the patterns of distribution of six indicators by education level of the mother.
DPT3 coverage is more than 2.4 times higher for children born to mothers with at least some secondary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 94% of women with at least some secondary education during childbirth compared to only 36% of women with no education. Moreover, only 8% of women without education and with expressed need for contraception use modern contraception, compared to 35% in the more educated group. The same is true of children experiencing stunting – the proportion is higher (three times) for children born to mothers with no formal education compared with those born to mothers with at least some secondary education. The prevalence of underweight women is, however, relatively constant across the three educational groups. Women with primary education are least likely to use bednets when pregnant, compared to women with no formal education or with at least some secondary education.

4.18 Mauritania

The data source used to assess inequities in health and access to health services is Mauritania’s Demographic and Health Survey, 2000. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Mauritania. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception.

Figure 4.89 shows the national average of infant and under-five mortality, as well as the gradient by wealth quintile, place of residence, educational achievement and sex of the child.
The gradient across household wealth quintiles based on data from 2000 is not consistent. For both infant and child mortality, the middle quintile (Q3) shows the highest levels, with children in poorer and richer households experiencing lower mortality rates. This is one example of the need to document inequities across different sub-populations and the entire gradient, in addition to gap measures that compare levels in the richest and poorest groups, as inputs to the evaluation and development of appropriate policies and programmes that aim to provide universal coverage and increase equity in health. Conversely, the opposite pattern is found for mother’s education level, where the middle group (women with primary education) have the lowest rates. Such patterns warrant discussion in light of the specific context in Mauritania. Rural area residents experience 0.9 time the under-five mortality among urban dwellers. Consistent with the evidence in other countries of the Region, both infant and under-five mortality rates are higher for boys than for girls. Figure 4.90 shows five indicators, stratified by wealth quintile.
The data shows wealth-related inequities along a consistent gradient for three indicators. Women in the richest quintile are 4.3 times more likely to be assisted by skilled health personnel during delivery (achieving high coverage level of 94%) than women in the poorest quintile. Similarly, coverage of DPT3 vaccination for children is 2.5 times higher in the richest quintile in comparison to the poorest quintile. In general, use of modern contraception among women with expressed need for contraception is low (national average 8.4%). While only 22% of women in the richest wealth quintile use modern contraception, this is significantly higher than any other quintile: none of the women in the poorest quintile with expressed need for contraception use modern contraception.

Among health indicators, the pattern of stunting in children across wealth quintiles reveals that between 33% and 41% of children in the bulk of households (the poorest 80%, or Q1 through Q4) experience stunting; this proportion dips to 23% for the richest quintile. Women in the poorest 20% of households are 1.8 times more likely to be underweight than women in the richest quintile. There is a gradual gradient for this indicator across wealth quintiles. Figure 4.91 depicts the rural-urban patterns for five indicators.
The figure shows that there are disparities between rural and urban areas, especially with respect to the health system indicators. For example, coverage of skilled birth attendance is nearly three times higher in urban areas than in rural areas while coverage of DPT3 vaccination is 1.7 times more in urban areas. Only 1% of women in rural areas with expressed need for contraception use modern contraception compared to 15% in urban areas. Stunting among children and prevalence of underweight women are 1.3 times higher (3 percentage points) in rural areas than in urban areas. Figure 4.92 shows five indicators by education of the mother.
Skilled personnel assist 56% of women with at least secondary education during childbirth, compared to a greater percentage (73%) for women with primary education and only 38% of women with no education. Similarly, only 5% of women without formal education and with expressed need for contraception use modern contraception, compared to approximately 11% in the two more educated groups (more than double). The proportion of children experiencing stunting is relatively high across all educational groups: it is somewhat higher (5 to 6 percentage points) for children born to mothers without formal education, compared to those born to mothers with primary or some secondary education.

### 4.19 Mozambique

The data used to assess inequities in health and access to health services come from Mozambique’s Demographic and Health Survey, 2003. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Mozambique. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception and counselling for HIV during antenatal care. Figure 4.93 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
Figure 4.93  Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Mozambique, DHS 2003

The data show that in 2003 households in the poorest quintile experience about 1.4 times greater infant and under-five mortality than households in the richest quintile. The infant and under-five mortality gradient shows a pattern of high mortality across all wealth groups; however, children in the upper-wealth groups experience somewhat lower mortality than children in poorer households. There are also inequities in mortality associated with the level of educational achievement of the mother. Children born to mothers with no formal education are 31% more likely to die before their first birthday than those born to mothers with secondary education or higher, and 26% more likely to die than those born to mothers with primary education. This association suggests that children of mothers with no formal education have higher mortality rates than children of mothers with at least primary education. Moreover, rural area residents experience 17% more infant mortality compared to urban dwellers, with a similar disadvantage for under-five mortality (15%). Consistent with the evidence in other countries of the Region, infant mortality for boys is higher than that for girls; this is not the case, however, for under-five mortality. Figure 4.94 shows seven indicators, stratified by wealth quintile.
In terms of access to health services, the data show a consistent wealth-related gradient and inequitable access for most indicators. For example, the probability of having skilled birth attendance is 3.4 times higher for women in the richest households than for those in the poorest households, and use of modern contraception is almost two times higher for women in the richest households than for women in the poorest households. Moreover, the gradient for these indicators reflects some level of mass deprivation, as the variation across the bulk of households (Q1 to Q4) is low: only the richest, or least poor, have better access or health outcomes. Interestingly, the evidence indicates that use of bednets by pregnant women decreases with wealth; in fact, the poorest women are 1.6 times more likely to use bednets during pregnancy than the richest women. Potential explanations, to be further explored, include that women in the richest households may believe that access to better housing conditions decreases the need to use bednets, that malaria is not endemic in wealthier urban areas, or that bednet use programmes do not target those who are relatively better off.

Inequities in health status are less pronounced but also worth noticing. Prevalence of stunting in children also presents some level of mass deprivation, as children in the majority of households have equivalently high levels of stunting (40% to 49%). Moreover, children in the richest households have a lower (almost 2 times lower) prevalence of stunting compared to children in the poorest households. There is a twofold variation in the prevalence of underweight women across household quintiles, with women in the richest households best off. Figure 4.95 depicts the rural-urban patterns for seven indicators.
The figure shows that rural areas are at a clear disadvantage in most indicators depicted. For example, relative to rural areas, the probability of having skilled birth attendance is 2.4 times higher in urban areas. Similarly, use of modern contraception and counselling for HIV during pregnancy are both 1.6 times higher in urban areas than in rural areas. Most interestingly, the evidence shows that use of bednets by pregnant women is higher in rural areas than in urban areas, for the same potential reasons discussed above. Regarding health status indicators, the proportion of children experiencing stunting and the prevalence of underweight women are also higher in rural areas than in urban ones: children in rural areas are almost 65% more likely to experience stunting than those in urban areas. Figure 4.96 shows seven indicators by education of the mother.
Children of mothers with at least secondary education are 1.6 times more likely to have DPT3 vaccination, compared to those of mothers with no formal education. Skilled personnel assist most women with at least secondary education (91%) during childbirth, compared to only 32% of women with no education. Similarly, only a quarter of women with no education and in need of contraception use modern contraception, compared to almost two thirds in the more educated group. By contrast, the gradient for use of bednets during pregnancy shows that women with no formal education are most likely to use bednets, as discussed previously. In addition, the pattern of inequities for prevalence of stunting in children differs from that of prevalence of underweight women: while the first one demonstrates wide disparities across levels of mother’s education (a 2.6-fold difference in favour of children with mothers with at least secondary education), the second presents smaller disparities across education groups.

**Trends in population averages and wealth inequities**

Table 4.13 summarizes the trends of health status and health system indicators. The findings indicate an improvement between 1997 and 2003 of population averages for all the indicators except stunting in children and women overweight. Infant and under-five mortality rates show a substantial decrease during the six-year period. The survey data show improvement in the national averages across all health system indicators especially contraceptive prevalence rate.
Table 4.13  Trends in population averages and household wealth inequities for selected health and health care indicators, Mozambique, DHS 1997 and 2003

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>134.6 100.7</td>
<td>1.1 1.4</td>
</tr>
<tr>
<td>Under-five mortality rate</td>
<td>200.9 152.4</td>
<td>1.1 1.4</td>
</tr>
<tr>
<td>Stunting in under-five children</td>
<td>35.9 40.7</td>
<td>1.6 1.9</td>
</tr>
<tr>
<td>Prevalence of underweight in women</td>
<td>10.9 8.6</td>
<td>3.5 1.6</td>
</tr>
<tr>
<td>Prevalence of overweight in women</td>
<td>9.2 13.9</td>
<td>9.5 4.5</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPT3 coverage</td>
<td>53.8 66.2</td>
<td>7.9 1.6</td>
</tr>
<tr>
<td>Delivery by skilled birth attendants</td>
<td>44.3 47.9</td>
<td>6.8 3.3</td>
</tr>
<tr>
<td>Contraceptive prevalence rate (women with expressed need for contraception)</td>
<td>9.8 35.6</td>
<td>14.0 1.9</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

However, the different indicators present different patterns in terms of inequity trends over the six-year period. The relative gap in infant and under-five mortality rates and stunting in under-five children shows a slight increase in inequity, whereas a substantial reduction in inequity is documented for the prevalence of underweight and overweight women. Trends for all health system indicators show a large reduction in inequity.

Table 4.14 summarizes trends in both population averages and relative gaps, and shows whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting results over time, as inputs to the development or assessment of health policies and their implementation.1 The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. In Mozambique, the health system indicators and underweight women represent this pattern. Figure 4.97 illustrates this pattern in DPT3 coverage.

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It is possible to see a widening of the relative gap even with improving population average (cell B). This pattern could result when the richest group improves faster than the poorest group. This is the case in infant and under-five mortality: in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a little bit. Also possible is a worsening of the population average coupled with a narrowing of the relative gap (cell C). Women overweight is an example as the prevalence of overweight is increasing in the richest quintile faster than in the poorest quintile. The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: stunting in children falls in this category (Figure 4.98). Combined with the prevalence of stunting in the country, this result clearly underlines an area that warrants special attention.

Table 4.14  Changes in Inequities and Population Averages, Mozambique, DHS 1997 and 2003

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>A. Best outcome</th>
<th>B. Widening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving</td>
<td>Narrowing</td>
<td>- DPT3 coverage</td>
<td>- Infant mortality rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delivery by skilled birth attendants</td>
<td>- Under-five mortality rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use of modern contraception (women with expressed need for contraception)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of underweight among women</td>
<td></td>
</tr>
<tr>
<td>Worsening/status quo</td>
<td></td>
<td>C. Prevalence of overweight among women</td>
<td>D. Worst outcome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>- Stunting</td>
</tr>
</tbody>
</table>

Figure 4.97  Trends in DPT3 Vaccination Coverage by Wealth Quintile – Mozambique, DHS 1997 and 2003.
**Main determinants of socioeconomic inequality in skilled birth attendance**

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequality for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.99 shows that wealth is by far the most important underlying cause of inequality, accounting for 23% of the inequality in access to skilled birth attendance. Wealth combined with all socioeconomic factors account for more than 45% of the inequality. Health system factors taken together account for 38% of inequality in skilled birth attendance and therefore also contribute significantly to inequality in access to skilled birth attendance. For Mozambique, these results imply that policies and interventions that address socioeconomic position, as well as improvements in health systems are both needed to reduce the inequities documented.
4.20 Namibia

The data used to assess inequities in health and access to health services come from Namibia’s Demographic and Health Survey, 2000. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Namibia. Health indicators assessed include infant and under-five mortality and prevalence of stunting in children. Health system indicators include coverage of DPT3 vaccination, use of bednets by pregnant women, coverage of skilled birth attendance and current use of modern contraception. Figure 4.100 shows infant and under-five mortality stratified by wealth quintile, place of residence, mother’s educational achievement and sex of the child.
The data show that in 2000 households in the poorest quintile experience 1.7 times greater infant mortality than households in the richest quintile. The mortality gradient by wealth quintile reflects an unusual pattern where the highest mortality rates, both for infant and under-five mortality, are in the low- and middle-wealth groups (Q2 and Q3), but not among the poorest population. There are also inequities in mortality associated with the level of educational achievement of the mother. Children born to mothers with no education are 1.7 times more likely to die before their first birthday than those born to mothers with secondary education or higher, but less likely to die than children born to mothers with primary education.1 Rural area residents experience 54% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are considerably higher than those for girls. Figure 4.101 shows three indicators, stratified by wealth quintile.

![Figure 4.101 Selected Indicators by Wealth Quintile, Namibia, DHS 2000](image)

The three indicators show significant wealth-related inequities and a consistent gradient across household groupings. For example, women in the richest households are 1.7 times more likely to be assisted by skilled health personnel during delivery than women in the poorest households. Although coverage of current use of modern contraception among women with expressed need for contraception is relatively high compared to other countries in the Region, there are still large wealth-related inequities, with more than a twofold difference between women in the poorest and best-off households. A similar twofold difference exists concerning inequities in prevalence of stunting in children, also in favour of children in the richest households in comparison to those in the poorest households. Figure 4.102 depicts the rural-urban patterns for three indicators.

1 Possible hypotheses: first, this is related to the labour category of mothers. Non-educated mothers could stay home and take better care of their children than working mothers with primary education; second, the education categories do not properly reflect the relationship between these two variables. We should have used instead “primary incomplete” and “primary complete”.

The figure shows that the disparities between rural and urban areas exist for two of the three indicators that focus on access to health services. For example, coverage of skilled birth attendance is 40% higher in urban areas than in rural areas. In relative terms, the magnitude of the disparities is similar for coverage of use of modern contraception. However, there is no evidence that prevalence of stunting in children differs significantly in urban and rural areas. Figure 4.103 shows three indicators by education of the mother.
Skilled personnel assist 87% of women with at least secondary education during childbirth, compared to 48% of women with no education. Similarly, women with at least secondary education and expressed need for contraception are 1.6 times more likely to use a modern contraception method than their counterparts with no formal education. The prevalence of stunting in children is also 45% higher among children of women with no formal education, compared to the best educated group.

### 4.21 Niger

The data used to assess inequities in health and access to health services come from Niger’s Demographic and Health Survey, 1998. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Niger. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Figure 4.104 shows infant and under-five mortality stratified by wealth quintile, place of residence, mother’s educational achievement and sex of the child.
Figure 4.104 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Niger, DHS 1998

The data show that in 1998 mortality levels are high across all wealth quintiles, with children and infants in households in the worst-off quintile experiencing approximately 1.6 and 1.8 times greater mortality respectively than children in households in the richest quintile. The mortality gradient by wealth reflects mass deprivation, as the four poorest quintiles, or 80% of the population, have similarly high levels. There are also inequities in mortality associated with educational achievement of the mother. Children born to mothers with no education are 1.6 times more likely to die before their first birthday than those born to mothers with secondary education or higher, and 1.3 times more likely than those born to mothers with primary education. The mortality gradient by educational achievement shows that lower levels of mortality are associated with higher levels of education. Rural area residents experience 78% more infant mortality compared to urban dwellers. Unlike the evidence in other countries of the Region, the infant mortality rate for boys is the same as the one for girls, and under-five mortality appears to be higher for females than for males. Figure 4.105 shows five indicators, stratified by wealth quintile.
In terms of access to health services, the data show huge wealth-related inequities, mainly between the richest group and the rest of the population. Note that inequities across household quintiles 1 to 4 are much smaller based on the survey data, reflecting a mass deprivation pattern. Children in the richest group are more than four times more likely to be fully covered by DPT3 vaccination than their counterparts in the poorest group, and wealthier mothers are six times more likely to be assisted by skilled health personnel during delivery. Similarly, coverage of current use of modern contraception among women with expressed need for contraception is still very low and almost exclusively concentrated in the richest quintile (just over one quarter of women). Inequities in health status are much less pronounced but still worth noticing. Prevalence of stunting in children in the poorest households is 26% higher than in the richest households and the percentage of underweight women is almost double among the poorest women than among the richest women. Figure 4.106 depicts the rural-urban patterns for five indicators.
Figure 4.106 Selected Indicators by Place of Residence. Niger, DHS 1998

The figure shows that the disparities between rural and urban areas are enormous, based on data from 1998, especially in indicators of access to health services. For example, coverage of DPT3 vaccination is almost five times higher in urban areas and coverage of skilled birth attendance is more than eight times higher in urban areas than in rural areas. In relative terms, the magnitude of the disparities is similar for modern contraception use. The prevalence of women experiencing underweight is also higher (1.7 times) in rural areas. The same is true of children experiencing stunting – the proportion is 1.7 times higher in rural areas compared to urban areas. Figure 4.107 shows five indicators by mother’s level of education.
Skilled personnel assist 70% of women with at least secondary education during childbirth, compared to only 14% of women with no education. Similarly, only 5% of women without formal education and with expressed need for contraception use modern contraception, compared to 47% in the more educated group (more than a ninefold difference). The prevalence of underweight women is also higher among women without formal education. The proportion of children experiencing stunting is 1.8 higher for children born to mothers without formal education compared with those born to women with at least secondary education.

4.22 Nigeria

The data used to assess inequities in health and access to health services come from Nigeria’s Demographic and Health Survey, 2003. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Nigeria. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception, use of antimalarial drugs during pregnancy and counselling for HIV during antenatal care. Figure 4.108 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The data show that in 2003 households in the poorest quintile experience 2.6 times greater mortality than households in the richest quintile. The mortality gradient by wealth is somewhat different for infant and under-five mortality. While lower infant mortality is consistently associated with greater household wealth, the gradient for under-five mortality suggests a pattern of mass deprivation, where only children in the richest 20% of households have much lower levels of mortality compared to those experienced by the bulk of households. There are also inequities in mortality associated with the level of educational achievement of the mother. Children born to mothers with no formal education are 1.7 times more likely to die before their first birthday than those born to mothers with secondary education or higher, but equally likely as those born to mothers with primary education. Moreover, rural area residents experience 43% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.109 shows seven indicators, stratified by wealth quintile.
In terms of access to health services, the data show large wealth-related inequities in all indicators, most of these presenting a pattern of mass deprivation where only women or children in the richest 20% of households are much better off. For example, children in the richest group are 4.4 times more likely to fully receive DPT3 vaccines than children in the poorest households. Wealthier women are more than four times more likely to be assisted by skilled health personnel during delivery than poor women; and coverage of counselling for HIV during antenatal care is 4.4 times higher in the richest quintile than in the poorest quintile. Similarly, coverage of current use of modern contraception is 29% among the richest women against only 11% among the poorest women. On the contrary, the evidence shows that use of bednets by children is higher among the poorer populations, although absolute levels remain very low across all household quintiles.

Inequities in health status are also worth noticing; the gradient is more consistent with a pattern of queuing. Prevalence of stunting in children in the poorest households is more than double that of children in the richest households. A similar pattern exists for prevalence of underweight women. Figure 4.110 depicts the rural-urban patterns for seven indicators.
Figure 4.110  Selected Indicators by Place of Residence, Nigeria, DHS 2003

The figure shows that rural areas are at a clear disadvantage in all indicators depicted, except use of bednets by children. For example, relative to rural areas, the proportion of children who fully receive DPT3 vaccines in urban areas is almost four times higher; the probability of having skilled birth attendance is more than two times higher, and counselling for HIV during antenatal care is almost three times higher. Similarly, the prevalence of underweight women and children experiencing stunting is higher in rural areas. Figure 4.111 shows seven indicators by education of the mother.
As much as 74% of women with secondary education or higher are assisted by skilled personnel during childbirth, compared to only 14% of women with no education (more than a fivefold difference). Similarly, only 5% of women without education and with expressed need for contraception use modern contraception, compared to 28% in the more educated group. Coverage of counselling for HIV during antenatal care also shows large inequities by education group with more than half of women with at least secondary education receiving this service compared to only 8% of women with no education. The prevalence of underweight women and children experiencing stunting also appears higher among women without formal education.

### 4.23 Rwanda

The 2005 DHS data were used to assess inequities in health and access to health services in Rwanda. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for Rwanda. The indicators assessed included infant and under-five mortality, coverage of DPT3 vaccination, stunting in children, use of bednets by pregnant women, prevalence of underweight women, proportion of births attended to by skilled health personnel, and proportion of women with an expressed need for contraception using some form of modern contraception. Figure 4.112 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The mortality gradient shows that in 2005 households in the poorest quintile experience a 38% higher infant mortality than households in the richest quintile, while such disparity was 53% for under-five mortality. There are also inequities in mortality associated with the education level of the mother. Infant mortality for children born to mothers with no formal education is more than 50% higher than that for children born to mothers with at least some secondary education. Under-five mortality shows the same trend. Children born to mothers with no formal education have a mortality rate which is more than 53% higher than that of children born to mothers with some secondary education. Similarly, rural area residents experience 54% more infant mortality and 76% more under-five mortality than urban dwellers. Unlike many other countries in the Region where mortality rates are significantly higher for boys, the infant mortality rate for boys is just 5% higher than that for girls, while under-five mortality is similar for both boys and girls. Figure 4.113 shows six indicators, stratified by wealth quintile.
With relatively high rates of coverage compared to other countries in the Region, members of households in the wealthiest quintile are only 7% more likely to receive DPT3 vaccines than those in the poorest quintile, though the difference is higher (19%) when compared to children in the fourth quintile. Differences are substantially higher for skilled birth attendance, as women in the richest households are almost 3.5 times more likely to be attended to by skilled personnel during childbirth compared to women in the poorest households. Women in the poorest quintile are 50% more likely to be underweight compared to those in the richest quintile, although the absolute levels are relatively similar across all households. The proportion of children experiencing stunting in poor households is 62% higher than those in the richest households. Women in the poorest quintile are 4.2 times more likely to express unmet need for contraception compared to those in the richest quintile. The use of bednets by pregnant women is 4.5 times more frequent in the richest households than in the poorest ones. Figure 4.114 depicts the rural-urban patterns for the six aforementioned indicators.
The figure shows that rural areas are at a disadvantage for most of the indicators depicted, except that a higher proportion (9% more) of children living in rural areas receive DPT3 vaccines compared to those living in urban areas. This shows that it is possible to provide access to services in more equitable ways to both rural and urban areas. Moreover, the prevalence of underweight women in rural areas is almost identical to that of women in urban areas (around 10%). However, births in urban areas are attended to more frequently (2.4 times) by skilled personnel. The same is true of children experiencing stunting – the proportion is higher (47% more) in rural areas compared to urban areas. Current use of modern contraception by women with expressed need for contraception is 2.1 times higher in urban areas in comparison to rural areas. Figure 4.115 depicts the patterns of distribution of six indicators by education of the mother.
DPT3 coverage is almost 12% higher for children born to mothers with at least primary education than for children born to mothers with no formal education. Similarly, skilled personnel assist 46% of women with at least some secondary education during childbirth compared to only 18% of women with no formal education (a 2.5-fold difference). Moreover, only 5% of women without formal education and with expressed need for contraception use modern contraception compared to 21% in the more educated group. The same is true of children experiencing stunting – the proportion is higher (31% more) for children born to mothers without formal education, compared with those born to mothers with at least some secondary education. The prevalence of underweight women is one third higher among women with no formal education or primary education, in comparison to women in the most educated group, although the absolute levels are relatively similar.

**Trends in population averages and wealth inequities**

Table 4.15 summarizes the trends of health status and health system indicators. Between 1992 and 2000, there was a sharp increase in infant and under-five mortality and a slight reduction in the prevalence of children experiencing stunting. Between 2000 and 2005, the prevalence of infant and under-five mortality dropped to slightly higher rates than 1992 while the prevalence of children experiencing stunting continued to increase. Prevalence data for underweight and overweight in women was only available for 2000 and 2005: these indicate that underweight worsened whereas the prevalence of overweight women declined. For health system indicators, the survey data show a worsening followed by an improvement for DPT3 coverage and use of modern contraception for women with expressed need for contraception in population averages. Skilled birth attendance shows a slight improvement across the 13 year period assessed by the three surveys.
Table 4.15  Trends in population averages and household wealth inequities for selected health and health care indicators, Rwanda, DHS 1992, 2000 and 2005

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
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</tr>
<tr>
<td>Infant mortality</td>
<td>85.0</td>
<td>107.4</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>150.8</td>
<td>196.2</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>48.7</td>
<td>42.4</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>8.9</td>
<td>9.8</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>12.6</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>85.9</td>
<td>63.4</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>26.1</td>
<td>26.8</td>
</tr>
<tr>
<td>Current use of modern contraception for women with expressed need for contraception</td>
<td>16.9</td>
<td>5.4</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes between 2000 and 2005, the different indicators present different patterns in terms of inequity trends over the five-year period. There is no evidence of change in inequity for children experiencing stunting and women overweight between the two surveys. The relative gaps in the health system indicators and infant mortality rates exhibit a reduction in inequity, whereas an increase in inequity is documented for the remaining indicators.

Table 4.16 summarizes trends focusing on the most recent changes between 2000 and 2005 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.1

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### Table 4.16  Changes in inequities and population averages focusing on the most recent changes, Rwanda (DHS 2000 and 2005)

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Improving</td>
<td>Narrowing A. Best outcome</td>
<td>B. Widening/status quo</td>
</tr>
<tr>
<td></td>
<td>- DPT3 coverage</td>
<td>- Under-five mortality rate</td>
</tr>
<tr>
<td></td>
<td>- Delivery by skilled attendants</td>
<td>- Prevalence of overweight among women</td>
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<tr>
<td></td>
<td>- Use of modern contraception for women with expressed need for contraception</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Infant mortality rate</td>
<td></td>
</tr>
<tr>
<td>Worsening/status quo</td>
<td>C.</td>
<td>D. Worst outcome</td>
</tr>
<tr>
<td></td>
<td>- Stunting</td>
<td>- Stunting</td>
</tr>
<tr>
<td></td>
<td>- Prevalence of underweight among women</td>
<td>- Prevalence of underweight among women</td>
</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between the richest and the poorest wealth quintiles narrows and the population average improves over time. All the health system indicators and the infant mortality rate represent this pattern. Figure 4.116 illustrates this pattern in DPT3 coverage focusing on the most recent changes between 2000 and 2005.

It is possible to see a widening of the relative gap even with improving population average (cell B). This pattern could result when the richest group improves faster than the poorest group. It is the case for the under-five mortality rate and the prevalence of women overweight: in spite of improving national averages, the relative gap between the poorest and richest quintiles has slightly widened. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C) although this situation was not evident in Rwanda based on the data and indicators analysed.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: children experiencing stunting (Figure 4.117) and underweight women fit in this category.
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequity for potential improvement. The results from this type of analysis, along with other contextual factors,
provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.118 below illustrates that wealth is by far the most important underlying factor, associated with more than 43% of the inequality in access to skilled birth attendance. Wealth combined with all socioeconomic factors account for almost 66% of the inequality. Health system factors and geographical factors taken together account for more than 21% of inequality in skilled birth attendance and therefore also contribute significantly to inequity in access to skilled birth attendance. For Rwanda, these results imply that policies and interventions that address socioeconomic position as well as improvements in health systems in rural and urban areas alike are both needed to reduce the inequities documented.

**Figure 4.118 Factors Contributing to Inequalities in Skilled Birth Attendance, Rwanda, DHS 2005**

### 4.24 Senegal

The data used to assess inequities in health and access to health services are taken from Senegal’s Demographic and Health Survey, 2005. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Senegal. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception, use of antimalarial drugs during pregnancy and counselling for HIV during antenatal care. Figure 4.119 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The data show that in 2005, consistent with gradients associated with mortality, households in the poorest quintile experience almost two times greater infant mortality than households in the richest quintile. For under-five mortality, the associated wealth gradient is much steeper, reflecting more pronounced inequalities across quintiles. There are also inequalities in mortality associated with the level of educational achievement of the mother. Children born to mothers with no formal education are 1.9 times more likely to die before their first birthday than those born to mothers with secondary education or higher, and 1.6 times more likely than those born to mothers with primary education. This suggests a clear disadvantage among children of mothers with no formal education compared to those of mothers with some level of instruction. Moreover, rural area residents experience 44% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.120 shows six indicators, stratified by wealth quintile.
The data from 2005 show large wealth-related inequities, with consistent patterns across three of the indicators. For example, wealthier women are almost four times more likely to be assisted by skilled health personnel during delivery than poor women. Similarly, current use of modern contraception is 29% higher among the richest women, compared to only 4% among the poorest ones. For both indicators, the gradient reflects a pattern of queuing, as middle-wealth and upper-wealth groups benefit the most. On the other hand, the gradient by wealth quintile for other access indicators such as coverage of DPT3 vaccination and use of antimalarial drugs during pregnancy show relatively smaller inequalities across wealth distribution.

Inequities in health status also warrant attention. Prevalence of children experiencing stunting in the poorest households is 3.5 times that of children in the richest households. A similar pattern holds for prevalence of women overweight. In this case, the richest women (almost one third) are three times more likely to be overweight than the poorest women. Figure 4.121 depicts the rural-urban patterns for six indicators.
The figure shows that rural areas are at a clear disadvantage in most indicators depicted, except for access to specific health system services: full DPT3 vaccination in children and use of antimalarial drugs during pregnancy have similar coverage rates in urban and rural areas. In contrast, relative to rural areas, the probability of having skilled birth attendance is 2.6 times higher in urban areas, and use of modern contraception among women in need of contraception is 3.6 times higher in urban areas. For children experiencing stunting, the proportion is higher in rural areas (more than 2.2 times) compared with urban areas. However, the prevalence of women experiencing overweight in urban areas is about twice as high as in rural areas. Figure 4.122 shows six indicators by education of the mother.
Skilled personnel assist as much as 88% of women with at least secondary education during childbirth, compared to 43% of women with no formal education (representing a twofold difference). Similarly, only 8% of women with no education and in need of contraception use a modern contraception method, compared to 39% in the more educated group (almost a fivefold difference). In terms of health status, the prevalence of stunting in children is almost four times greater among children whose mothers have no formal education in comparison with children of mothers with at least some secondary education. Similar to the evidence found in Senegal for other population sub-groups, coverage of DPT3 vaccination and use of antimalarial drugs show less inequities associated with level of education.

**Trends in population averages and wealth inequities**

Table 4.17 summarizes the trends of health status and health system indicators. For health status indicators, the findings between 1993, 1997 and 2005 of population averages show improvement in infant and under-five mortality rates. The prevalence of both underweight and overweight women, and children experiencing stunting, however, are only available for 1993 and 2005. An improvement is evident for stunting in children, whereas the prevalence of both underweight and overweight women worsened. For health system indicators, the survey data show an improvement in the use of modern contraception by women with expressed need for contraception and in skilled birth attendance. Coverage of DPT3 vaccination at the national level shows a 25% improvement between 1993 and 2005.
Table 4.17 Trends in Population Averages and Household Wealth Inequities for Selected Health and Health Care Indicators, Senegal, DHS 1993, 1997 and 2005

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<tr>
<td><strong>Health status</strong></td>
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<tr>
<td>Infant mortality</td>
<td>68.2</td>
<td>67.7</td>
<td>61.1</td>
<td>2.1</td>
<td>2.0</td>
<td>1.9</td>
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<tr>
<td>Under-five mortality</td>
<td>131.8</td>
<td>139.1</td>
<td>121.3</td>
<td>2.8</td>
<td>2.7</td>
<td>2.3</td>
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<tr>
<td>Prevalence of stunting in children</td>
<td>24.7</td>
<td>15.9</td>
<td>3.2</td>
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<tr>
<td>Prevalence of underweight women</td>
<td>14.9</td>
<td>18.0</td>
<td>1.8</td>
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<tr>
<td>Prevalence of women overweight</td>
<td>15.5</td>
<td>21.7</td>
<td>4.0</td>
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<td><strong>Health systems</strong></td>
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</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>48.9</td>
<td>61.4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>47.3</td>
<td>46.7</td>
<td>52.3</td>
<td>5.7</td>
<td>4.3</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current use of modern contraception for women</td>
<td>7.2</td>
<td>11.1</td>
<td>14.5</td>
<td>32.3</td>
<td>32.2</td>
<td>7.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes with complete information between 1993 and 2005, the different indicators present different patterns in terms of national averages and inequity trends over the 12 year period. The relative gap in children experiencing stunting shows an increase in inequity, whereas a decrease in inequity is documented for the remaining indicators. For example, while the disparity is still considerable, there was a dramatic decline in inequity for modern contraception use from 1997 to 2005, from a 32-fold difference between women in the richest and poorest households to an 8-fold difference.

Table 4.18 summarizes trends focusing on the most recent changes with complete information between 1993 and 2005 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.¹

Table 4.18  Changes in inequities and population averages focusing on the most recent changes with complete information (between DHS 1993 and 2005) – Senegal

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Improving</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A. Best outcome</td>
<td></td>
<td>B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- DPT3 coverage</td>
<td></td>
<td>- Stunting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Delivery by skilled birth attendants</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- Use of modern contraception for women with expressed need for contraception</td>
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<tr>
<td></td>
<td></td>
<td>- Infant mortality rate</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- Under-five mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Prevalence of underweight among women</td>
<td></td>
<td>D. Worst outcome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prevalence of overweight among women</td>
<td></td>
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</tr>
</tbody>
</table>

The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. All the health system indicators and both the infant and under-five mortality rates represent this pattern. Figure 4.123 illustrates this pattern in DPT3 vaccination focusing on the most recent changes with complete information between 1993 and 2005.

It is possible to see a widening of the relative gap even with improving population average (cell B). This pattern could result when the richest group improves faster than the poorest group. This is the case in stunting in children (Figure 4.124): in spite of improving national averages, the relative gap between the poorest and richest quintiles has slightly widened. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). The prevalence of both underweight women and women overweight (Figure 4.125) exhibits this pattern.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average, although this situation was not evident in Senegal based on the data available and indicators analysed.
Figure 4.123  Trends in DPT3 Vaccination Coverage by Wealth Quintile, Senegal, DHS 1993 and 2005

Figure 4.124  Trends in Stunting in Children by Wealth Quintile, Senegal, DHS 1993 and 2005
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider areas of inequity for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.126 shows that wealth is by far the most important underlying factor associated with almost 48% of the inequality in access to skilled birth attendance. Wealth combined with all socioeconomic factors account for about 44% of inequality in access to skilled birth attendance. Health system factors taken together are associated with more than 13% of the inequality and therefore contribute significantly to inequity in access to skilled birth attendance. Moreover, the living environment is associated with 33% of the inequalities documented. For Senegal, these results imply that policies and interventions that address socioeconomic position, improvements in health systems and better distribution of resources across the country are needed to reduce the inequities documented.
4.25 South Africa

The data source used to assess inequities in health and access to health services is South Africa’s Demographic and Health Survey, 1998. As at June 2008 when the analysis was done, this was the most recent DHS data available in the public domain for South Africa. Health indicators assessed include infant and under-five mortality. Health system indicators include coverage of skilled birth attendance and current use of modern contraception. Figure 4.127 shows the national average of infant and under-five mortality, as well as the gradient by wealth quintile, place of residence, educational achievement and sex of the child.
The data from 1998 shows that households in the poorest quintile experience 3.5 times greater under-five mortality than households in the richest quintile. The under-five mortality gradient by wealth quintile reflects a sharp drop after the poorest quintile. For infant mortality, children in the poorest households have almost a 40% greater mortality rate than children in the wealthiest households. Moreover, there is a clear association between infant and under-five mortality and mother’s level of education. A sharp drop in both infant and under-five mortality is associated with the highest level of mother’s education, with a more gradual drop of mortality between the two lower levels of education. For instance, children born to mothers with no education are 1.9 times more likely to die before their first birthday than those born to mothers with secondary education or higher, and almost equally (1.1 times) likely to die as those born to mothers with primary education. Rural area residents experience 1.5 times higher under-five mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.128 shows two indicators, stratified by wealth quintile.

**Figure 4.128 Selected Indicators by Wealth Quintile, South Africa, DHS 1998**

In terms of access to health services, the data show a consistent pattern of wealth-related inequities for skilled birth attendance and use of modern contraception. Women in the richest quintile are 1.4 times more likely to be assisted by skilled health personnel during delivery than women in the poorest quintile. Similarly, coverage of current use of modern contraception among women with expressed need is 1.6 times higher in the richest quintile in comparison to the poorest quintile. Figure 4.129 depicts the rural-urban patterns for two indicators.
The figure shows that there are significant disparities between rural and urban areas. For example, coverage of skilled birth attendance is 1.2 times higher in urban areas than in rural areas. In relative terms, the magnitude of disparities is similar for coverage of use of modern contraception - 1.3 times higher in urban areas compared to rural areas. Figure 4.130 shows two indicators by education of the mother.
Ninety-one per cent of women with at least secondary education are assisted by skilled personnel during childbirth (a high level compared to other countries in the Region), compared to 62% of women with no formal education. Similarly, only 28% of women without formal education and with expressed need for contraception use a modern contraception method, compared to 64% in the most educated group (more than a twofold difference).

### 4.26 Tanzania

The data used to assess inequities in health and access to health services are taken from Tanzania’s Demographic and Health Survey, 2004. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Tanzania. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception, use of antimalarial drugs during pregnancy, and counselling for HIV during antenatal care. Figure 4.131 shows infant and under-five mortality for the whole country stratified by wealth quintile, place of residence, educational achievement and sex of the child.

**Figure 4.131 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Tanzania, DHS 2004**

The data show that in 2004 infant and under-five mortality levels among households in the poorest quintile were 14% and 29% higher respectively than those among households in the richest quintile. The mortality gradient by wealth quintile reflects a pattern where children in the poorest 60% of households have similar and much higher levels of mortality than the rest of the children. Looking at mortality by level of educational achievement of the mother, the results show that children born to mothers with no formal education are 1.2 times more likely to die before their first birthday than those born to mothers with secondary education or higher, and 1.1 times more likely than those born
to mothers with primary education. This suggests that high levels of mortality in the country are not that strongly associated with level of education, although there is a consistent gradient. Moreover, rural area residents experience 15% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.132 shows seven indicators, stratified by wealth quintile.

**Figure 4.132 Selected Indicators by Wealth Quintile, Tanzania, DHS 2004**

In terms of access to health services, the data show significant wealth-related inequities in all indicators. For example, wealthier women are almost three times more likely to be assisted by skilled health personnel during delivery than the poorest women, and coverage of current use of modern contraception is 2.7 times higher in the richest quintile than in the poorest quintile. Similarly, the proportion of women receiving counselling for HIV during antenatal care is three times larger among the richest women than the poorest women. Interestingly, the gradient by wealth quintile for use of bednets by pregnant women and coverage of skilled birth attendance reflects mass deprivation, as the majority of the population has equivalent but deficient access to health services while the richest 20% has almost a fourfold advantage compared to the poorest quintile.

Inequities in health status also warrant attention. Again, the gradient by wealth for prevalence of children experiencing stunting reflects mass deprivation, given the high prevalence levels of all other quintiles in comparison to the richest quintile of households. Absolute prevalence of underweight women is similar across women in different wealth groups, yet there is a clear gradient. Figure 4.133 depicts the rural-urban patterns for seven indicators.
The figure shows that rural areas are at a clear disadvantage in all indicators depicted. For instance, the probabilities of using a modern contraception method and receiving counselling for HIV during antenatal care are twice higher in urban areas than in rural areas. Skilled birth attendance and use of bednets by pregnant women when stratified by place of residence are other access indicators that show the highest disparities in coverage rates (between 2.1- and 2.8-fold difference, respectively). Similarly, the prevalence of underweight women is 40% higher in rural areas. The same pattern holds for children experiencing stunting – the percentage is 54% higher in rural areas compared to urban areas. Figure 4.134 shows seven indicators by education level of the mother.
Some 60% of women with at least secondary education use an antimalarial drug during pregnancy compared to 47% with primary education and 41% with no education. Compared to women with no formal education, women with at least secondary education are 1.7 times more likely to have skilled birth attendance. The relationship of health status indicators with education is less clear. For example, the data suggest that the prevalence of underweight women and children experiencing stunting is higher for women with primary education than for women with no education at all.

**Trends in population averages and wealth inequities**

Table 4.19 summarizes the trends of health status and health system indicators. For health status indicators, the population averages between 1992, 1996, 1999 and 2004 show a general trend of improvement for both infant and under-five mortality and a general trend of worsening for children experiencing stunting. The prevalence of both underweight and overweight women was only available for 1992, 1996 and 2004. Both indicators show an increase in prevalence over the eight year period. Concerning health system indicators, national averages of use of modern contraception by women with expressed need for contraception show a consistent trend of improvement; in contrast, both DPT3 coverage and skilled birth attendance have declined.
Table 4.19  Trends in population averages and household wealth inequities for selected health and health care indicators, Tanzania, DHS 1992, 1996, 1999 and 2004

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
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<td><strong>Health status</strong></td>
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<tr>
<td>Infant mortality</td>
<td>91.6</td>
<td>87.5</td>
<td>99.1</td>
<td>68.0</td>
<td>1.2</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>140.9</td>
<td>136.5</td>
<td>146.6</td>
<td>112.0</td>
<td>1.2</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>43.2</td>
<td>43.4</td>
<td>37.1</td>
<td>49.3</td>
<td>1.5</td>
<td>1.7</td>
<td>2.3</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>9.5</td>
<td>9.3</td>
<td>10.3</td>
<td>2.5</td>
<td>1.7</td>
<td>2.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>11.1</td>
<td>13.3</td>
<td>17.5</td>
<td>3.0</td>
<td>3.4</td>
<td>4.8</td>
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<td><strong>Health systems</strong></td>
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<tr>
<td>Coverage of DPT3 vaccination</td>
<td>69.3</td>
<td>72.2</td>
<td>68.9</td>
<td>22.7</td>
<td>1.5</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>53.1</td>
<td>47.0</td>
<td>43.9</td>
<td>46.4</td>
<td>2.7</td>
<td>2.9</td>
<td>3.0</td>
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<tr>
<td>Current use of modern contraception for</td>
<td>8.2</td>
<td>18.1</td>
<td>23.0</td>
<td>25.9</td>
<td>21.3</td>
<td>7.2</td>
<td>4.9</td>
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<tr>
<td>women with expressed need for contraception</td>
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</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

However, when focusing on the most recent changes with complete information between 1996 and 2004, the different indicators present different patterns in terms of inequality trends over the eight year period. The relative gaps in stunting in children and prevalence of women overweight show an increase in inequity, whereas a reduction in inequity is documented for the remaining indicators.

Table 4.20 summarizes trends focusing on the most recent changes with complete information between 1996 and 2004 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.1

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Table 4.20 Changes in inequities and population averages focusing on the most recent changes with complete information (between DHS 1996 and 2004), Tanzania

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
</tr>
</thead>
</table>
| Improving          | A. Best outcome  
- Use of modern contraception for women with expressed need for contraception  
- Infant mortality rate  
- Under-five mortality rate  

| Worsening/status quo |
|----------------------|-------------------|
| C.                   | D. Worst outcome  
- DPT3 coverage  
- Delivery by skilled birth attendants  
- Prevalence of underweight among women  

The best outcome (cell A) shows that the relative gap - or ratio - between the richest and the poorest wealth quintiles narrows and the population average improves over time. Use of modern contraception for women with expressed need for contraception and both the infant and under-five mortality rates represent this pattern. Figure 4.135 illustrates this pattern in infant mortality rate focusing on the most recent changes with complete information between 1996 and 2004.

It is possible to see a widening of the relative gap even with improving population average (cell B) although this situation was not evident in Tanzania based on the data and indicators that were analysed. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). This is the case in DPT3 coverage, skilled birth attendance and prevalence of underweight women.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: stunting in children (Figure 4.136) falls in this category along with the prevalence of women overweight.
Figure 4.135  Trends in Infant Mortality by Wealth Quintile, Tanzania, DHS 1992, 1996, 1999 and 2004

Figure 4.136  Trends in Stunting in Children by Wealth Quintile, Tanzania, DHS 1992, 1996, 1999, and 2004
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequity for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.137 below illustrates that wealth and other socioeconomic position-related factors account for nearly 60% of the inequality in access to skilled birth attendance. Nevertheless, health system factors taken together explain about 20% of the inequality and therefore also contribute significantly to the socioeconomic inequality in skilled birth attendance. These results imply that policies and interventions that address socioeconomic position, as well as improvements in health systems are both needed to reduce the socioeconomic inequality documented.

Figure 4.137 Factors Contributing to Inequalities in Skilled Birth Attendance, Tanzania, DHS 2004

4.27 Togo

The data used to assess inequities in health and access to health services are taken from Togo’s Demographic and Health Survey, 1998. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Figure 4.138 shows infant and under-five mortality for the whole country stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The data show that in 1998 households in the poorest quintile experience 1.5 times greater infant mortality than households in the richest quintile. The mortality gradient by wealth quintile reflects a relatively similar level across the four poorest quintiles, or 80% of households. There are also inequalities in mortality associated with the level of educational achievement of the mother. Children born to mothers with no formal education are 1.5 times more likely to die before their first birthday than those born to mothers with secondary education or higher, and 1.2 times more likely than those born to mothers with primary education. Similarly, rural area residents experience 27% more infant mortality compared to urban dwellers. Overall, the gradient by different socioeconomic stratifiers appears to be more pronounced for under-five mortality than for infant mortality. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are considerably higher than those for girls. Figure 4.139 shows five indicators, stratified by wealth quintile.
In terms of access to health services, the data show large and consistent wealth-related inequities in four indicators. Children in the richest group are two times more likely to be fully covered by DPT3 vaccination than their counterparts in the poorest group and wealthier women are more than three times more likely to be assisted by skilled health personnel during delivery than poor women. Coverage of current use of modern contraception among women with expressed need for contraception also increases with wealth, with almost a fivefold difference between women in the poorest and richest households.

Inequities in health status also warrant attention, and the gradient reflects a consistent pattern. Prevalence of children experiencing stunting in the poorest households is more than two times higher than in the richest households. Likewise, the percentage of underweight women is twice as high among the poorest women as the richest women. Figure 4.140 depicts the rural-urban patterns for five indicators.
The figure shows that rural areas are at a clear disadvantage in all five indicators depicted. For example, a much higher proportion of children (60% more) are fully covered by DPT3 vaccination in urban than in rural areas; the probability of having skilled birth attendance is more than two times higher in urban areas than in rural areas. Similarly, the prevalence of children experiencing stunting is 60% higher in rural areas. The same is true of underweight women – the proportion is higher in rural areas compared with urban areas, although the disparities are less pronounced in absolute terms. Figure 4.141 shows five indicators by education level of the mother.

**Figure 4.140 Selected Indicators by Place of Residence, Togo, DHS 1998**

![Graph showing selected indicators by place of residence.]

**Figure 4.141 Selected Indicators by Education Level, Togo, DHS 1998**

![Graph showing selected indicators by education level.]

The figure shows that rural areas are at a clear disadvantage in all five indicators depicted. For example, a much higher proportion of children (60% more) are fully covered by DPT3 vaccination in urban than in rural areas; the probability of having skilled birth attendance is more than two times higher in urban areas than in rural areas. Similarly, the prevalence of children experiencing stunting is 60% higher in rural areas. The same is true of underweight women – the proportion is higher in rural areas compared with urban areas, although the disparities are less pronounced in absolute terms. Figure 4.141 shows five indicators by education level of the mother.
Skilled personnel assist most women with at least secondary education (89%) during childbirth, compared to only 37% of women with no education (almost a 2.5-fold difference). Similarly, only 6% of women without formal education and with expressed need for contraception use a modern contraception method, compared to 23% in the more educated group. The prevalence of children experiencing stunting also appears higher for children of women with no formal education. On the contrary, in Togo, the prevalence of underweight women does not appear to be associated with their level of education.

4.28 Uganda

The data source used to assess inequities in health and access to health services is Uganda’s Demographic and Health Survey, 2000/01. As at June 2008 when the analysis was carried out, this was the most recent DHS data available in the public domain for Uganda. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination and skilled birth attendance and current use of modern contraception. Figure 4.142 shows the national average of infant and under-five mortality, as well as the gradient by wealth quintile, place of residence, educational achievement and sex of the child.

**Figure 4.142 Infant and Under-five Mortality by Wealth Quintile, Place of Residence, Education Level and Sex, Uganda, DHS 2000/01**

The data from the 2000/01 survey shows that households in the poorest and second poorest quintiles experience 1.6 and 1.8 times more under-five mortality than households in the richest quintile. The under-five mortality gradient by wealth quintile reflects a steady decline after the two poorest quintiles, whereas for infant mortality, the main relative difference is between the poorest quintile and all the other quintiles. However, by mother’s education level, a sharp drop (almost half) in both infant and under-five mortality is documented for the highest level of education, with similar levels of mortality for lower levels of education. For instance, children born to mothers with no education are 1.9
times more likely to die before their first birthday than those born to mothers with secondary education or higher, and almost equally (1.05 times) likely to die than those born to mothers with primary education. Rural area residents experience 1.7 times higher under-five mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls. Figure 4.143 shows five indicators, stratified by wealth quintile.

**Figure 4.143 Selected Indicators by Wealth Quintile, Uganda, DHS 2000/01**

In terms of access to health services, the data show wealth-related inequities for skilled birth attendance and use of modern contraception, with the richest quintile having significantly higher coverage rates than the rest of the population. Women in the richest quintile are 3.5 times more likely to be assisted by skilled health personnel during delivery than women in the poorest quintile. Similarly, coverage of current use of modern contraception among women with expressed need for contraception is 5.4 times higher in the richest quintile in comparison to the poorest quintile. In general, use of modern contraception among women with expressed need for contraception is low (national average of 22%). There is no clear gradient across wealth quintiles for coverage of DPT3 vaccination.

Among health indicators, the pattern of children experiencing stunting across wealth quintiles reveals similar high levels within the poorest 80% of households, varying between 39% and 42%, with 27% prevalence for children in the richest households. Women in the poorest households are 3.4 times more likely to be underweight than women in the richest households, with a consistent gradient across wealth quintiles. Figure 4.144 depicts the rural-urban patterns for five indicators.
Figure 4.144 Selected Indicators by Place of Residence, Uganda, DHS 2000/01

The figure shows that there are disparities between rural and urban areas, with four indicators showing disparities in favour of urban areas, with the greatest relative and absolute differences noted for skilled birth attendance and use of contraception among women with expressed need for contraception. For example, coverage of skilled birth attendance is 2.5 times higher in urban areas than in rural areas. In relative terms, the magnitude of disparities is similar for coverage of use of modern contraception. The prevalence of children experiencing stunting is 1.5 times higher in rural areas than in urban areas, while women in rural areas are more than twice likely to be underweight than women in urban areas. Disparities in coverage of DPT3 vaccination between urban and rural areas are small (3 percentage points), with the 2000/01 data indicating slightly higher coverage in rural areas. Figure 4.145 shows five indicators by educational achievement of the mother.
Skilled personnel assist 67% of women with at least secondary education during delivery, compared to only 22% of women with no education, a threefold difference. Similarly, women without formal education and with expressed need for contraception are 3.6 times less likely to use a modern contraception method, compared to women in the most educated group. The proportion of children experiencing stunting and underweight women is higher for less educated mothers compared with women with secondary education or more.

### 4.29 Zambia

The data used to assess inequities in health and access to health services are taken from Zambia’s Demographic and Health Survey, 2001. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Zambia. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, use of bednets by children and pregnant women, coverage of skilled birth attendance, current use of modern contraception, use of antimalarial drugs during pregnancy and counselling for HIV during antenatal care. Figure 4.146 shows infant and under-five mortality stratified by wealth quintile, place of residence, educational achievement and sex of the child.
The data show that in 2001 households in the poorest quintile experience 1.8 times greater infant mortality and almost 1.7 times greater under-five mortality than households in the richest quintile. Moreover, the gradient by wealth quintile for both infant and under-five mortality reflects a pattern where the low- and middle-wealth groups (poorest, Q2, Q3 and Q4) have almost the same mortality rates, and significantly lower mortality is documented in the richest group. There are also inequalities in mortality associated with the level of educational achievement of the mother. Consistent with the gradient across household wealth quintiles, the mortality rates among children born to women with secondary education or higher are significantly lower than the rest of the population. Moreover, rural area residents experience 19% more infant mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, infant and under-five mortality rates for boys are higher than those for girls, yet the absolute difference for infant mortality is small (four percentage points). Figure 4.147 shows six indicators, stratified by wealth quintile.
In terms of access to health services the data show large wealth-related inequities in most indicators, with a consistent pattern across the gradient. Inequities in coverage of skilled birth attendance are very large, as wealthier women are almost 4.7 times more likely to have skilled birth attendance than the poorest women: the absolute gap in coverage between the middle-wealth group (Q3) and the richest group is 58 percentage points (almost a threefold difference). Similarly, use of bednets by pregnant women and current use of modern contraception also reflect large inequities by wealth, and overall low levels for the poorer wealth groups. By contrast, coverage of DPT3 vaccination in children shows relatively higher levels achieved and smaller disparities across wealth groups.

Inequities in health status also warrant attention. Although a clear gradient across households exists, more than half of all children in the poorest and middle-wealth households experience stunting; although less, a third of children in the richest households are also stunted. The proportion of underweight women among the poorest women is twice as high as that among the richest women. Figure 4.148 depicts the rural-urban patterns for six indicators.
The figure shows that rural areas are at a clear disadvantage in all indicators depicted. For example, relative to rural areas, the probability of having skilled birth attendance in urban areas is 2.8 times higher, and use of modern contraception among women in need of contraception is 1.9 times higher in urban areas. Similarly, the prevalence of underweight women is 55% higher in rural areas. The same pattern holds for children experiencing stunting – the prevalence is 38% higher in rural areas compared to urban areas. Figure 4.149 shows six indicators by education level of the mother.
Educational achievement is an important factor that is associated with inequities in health, with a consistent gradient noted across all indicators. As much as 65% of women with at least secondary education are assisted by skilled personnel during childbirth, compared to only 17% of women with no formal education (more than a 3.8-fold difference). Similarly, only 9% of women with no formal education use bednets during pregnancy, compared to 26% in the more educated group. In contrast, the gradient by education level for coverage of DPT3 vaccination is less pronounced than other indicators of access to health services. For prevalence of children experiencing stunting and prevalence of underweight women, only the group of higher educated women experience significantly different rates: it is important to note that the absolute levels of stunting based on 2001 data are very high in Zambia in comparison to other countries in the Region.

**Trends in population averages and wealth inequities**

Table 4.21 summarizes the trends of health status and health system indicators. For health status indicators, the findings between 1992, 1996 and 2001 indicate a general improvement for infant and under-five mortality rates, a consistent improvement for the prevalence of women overweight and a worsening in the prevalence of underweight women and children experiencing stunting. For health system indicators, the survey data show a consistent improvement for use of modern contraception by women with expressed need for contraception, a persistent worsening for skilled birth attendance and a slight worsening for DPT3 coverage.
Table 4.21  Trends in population averages and household wealth inequities for selected health and health care indicators, Zambia, DHS 1992, 1996 and 2001

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population average</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>107.4</td>
<td>108.9</td>
</tr>
<tr>
<td>Under-five mortality</td>
<td>191.2</td>
<td>196.6</td>
</tr>
<tr>
<td>Prevalence of stunting in children</td>
<td>39.8</td>
<td>42.4</td>
</tr>
<tr>
<td>Prevalence of underweight women</td>
<td>10.9</td>
<td>9.0</td>
</tr>
<tr>
<td>Prevalence of women overweight</td>
<td>14.0</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>Health systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage of DPT3 vaccination</td>
<td>63.4</td>
<td>76.2</td>
</tr>
<tr>
<td>Coverage of skilled birth attendance</td>
<td>50.4</td>
<td>46.7</td>
</tr>
<tr>
<td>Current use of modern contraception for women with expressed need for contraception</td>
<td>11.8</td>
<td>16.6</td>
</tr>
</tbody>
</table>

* Poorest to richest ratio is used for infant and under-five mortality rates, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for prevalence of overweight in women, DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate.

When focusing on the most recent changes between 1996 and 2001 the different indicators present different patterns in terms of inequity trends over the five-year period. The relative gaps in coverage of skilled birth attendance, use of modern contraception for women with expressed need for contraception and stunting in children show a reduction in inequity, whereas an increase in inequity is documented for the remaining indicators.

Table 4.22 summarizes trends focusing on the most recent changes between 1996 and 2001 in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework for interpreting the results over time, as inputs to the development or assessment of health policies and their implementation.\(^1\)

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Table 4.22  Changes in inequities and population averages focusing on the most recent changes (between DHS 1996 and 2001), Zambia

<table>
<thead>
<tr>
<th>Population average</th>
<th>Relative gap</th>
<th>Narrowing</th>
<th>Widening/status quo</th>
</tr>
</thead>
</table>
| Improving          | A. **Best outcome**  
|                    | - Use of modern contraception for women with expressed need for contraception | | B. |
|                    | C. - Delivery by skilled birth attendants  
|                    | - Stunting | | D. **Worst outcome**  
|                    | - DPT3 coverage | | - Prevalence of underweight among women |
| Worsening/status quo | - Stunting | | | - Prevalence of underweight among women |

The best outcome (cell A) shows that the relative gap - or ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. Use of modern contraception for women with expressed need for contraception represents this pattern. Figure 4.150 illustrates this pattern in use of modern contraception for women with expressed need for contraception focusing on the most recent changes between 1996 and 2001.

It is possible to see a widening of the relative gap even with improving population average (cell B). This pattern could result when the richest group improves faster than the poorest group. This is the case in both the infant and under-five mortality rates and prevalence of women overweight: in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a little bit. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). Skilled birth attendance and children experiencing stunting fall in this category.

The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: DPT3 coverage (Figure 4.151) falls in this category along with the prevalence of underweight women.
Figure 4.150  Trends in Use of Modern Contraception for Women with Expressed Need for Contraception by Wealth Quintile, Zambia, DHS 1992, 1996 and 2001

![Contraception Trends](image)

Figure 4.151  Trend of DPT3 Vaccination Coverage by Wealth Quintile, Zambia, DHS 1992, 1996, and 2001

![DPT3 Vaccination Coverage](image)
Main determinants of socioeconomic inequality in skilled birth attendance

Decomposing the factors that are specifically associated with socioeconomic inequality in skilled birth attendance provides a useful lens to consider specific areas of inequity for potential improvement. The results from this type of analysis, along with other contextual factors, provide an important input to national debates and deliberations on the development of policies, strategies or specific interventions to reduce inequities in health processes or outcomes, as they pinpoint some key factors contributing to the observed inequality in access to skilled birth attendance.

Figure 4.152 shows that wealth is by far the most important underlying factor associated with 44% of the inequality in access to skilled birth attendance. Wealth combined with all socioeconomic factors account for more than 66% of the inequality. Health system factors taken together account for nearly 20% of the inequality and therefore also contribute significantly to inequality in access to skilled birth attendance. For Zambia, these results imply that policies and interventions that address socioeconomic position as well as improvements in health systems in all regions of the country are both needed to reduce the inequities documented.

Figure 4.152 Factors Contributing to Inequalities in Skilled Birth Attendance, Zambia, DHS 2001

4.30 Zimbabwe

The data source used to assess inequities in health and access to health services is Zimbabwe’s Demographic and Health Survey, 1999. As at June 2008 when the analysis was conducted, this was the most recent DHS data available in the public domain for Zimbabwe. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of underweight and overweight women. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Figure 4.153 shows the national average of infant and under-five mortality, as well as the gradient by wealth quintile, place of residence, educational achievement and sex of the child.
The data from 1999 shows that households in the poorest quintile experience 1.5 times greater under-five mortality than households in the richest quintile. The child mortality gradient by wealth quintile reflects mass deprivation, as the four poorest quintiles, covering 80% of households, have similar levels. The infant mortality gradient across household wealth quintiles is not consistent, based on data from 1999. For both infant and under-five mortality, the middle quintile (Q3) shows the highest levels, with children in poorer and richer households experiencing lower mortality rates. This is one example of the need to document inequities across different sub-populations and the entire gradient, in addition to gap measures that compare levels in the richest and poorest groups, as inputs to evaluation and development of appropriate policies and programmes that aim to provide universal coverage and increase equity in health.

In contrast, the mortality gradient, for both infant and under-five mortality, by education group is associated with lower levels with higher levels of education. For instance, children born to mothers with no formal education are 1.5 times more likely to die before their first birthday than those born to mothers with secondary education or higher, and 1.4 times more likely to die than those born to mothers with primary education. Rural area residents experience 1.2 times higher under-five mortality compared to urban dwellers. Consistent with the evidence in other countries of the Region, both infant and under-five mortality rates are higher for boys than for girls. Figure 4.154 shows four indicators, stratified by wealth quintile.
In terms of access to health services, the data show a consistent pattern of wealth-related inequities across the gradient. Women in the richest quintile are 1.6 times more likely to be assisted by skilled health personnel during delivery than women in the poorest quintile. Similarly, coverage of current use of modern contraception among women with expressed need for contraception is 1.4 times higher in the richest quintile in comparison to the poorest quintile.

Inequities in health status by household wealth quintiles are much less pronounced for prevalence of underweight women (a three percentage point difference between the poorest and richest households). Children in the poorest households are 1.7 times more likely to experience stunting than children in the richest households, with similar high levels found in the poorest and middle household wealth groups. Figure 4.155 depicts the rural-urban patterns for four indicators.
Figure 4.155  Selected Indicators by Place of Residence, Zimbabwe, DHS 1999

The figure shows that there are disparities between rural and urban areas, all in favour of urban areas. For example, coverage of skilled birth attendance is 1.4 times higher in urban areas than in rural areas. In relative terms, the magnitude of the disparities is similar for coverage of use of modern contraception. The prevalence of children experiencing stunting is also 1.4 times higher in rural areas compared to urban areas. The difference in the prevalence of underweight women between rural and urban areas is marginal (one percentage point). Figure 4.156 shows four indicators by education level of the mother.
Skilled personnel assist 80% of women with at least secondary education during childbirth, compared to only 43% of women with no education (a twofold difference). Similarly, only 37% of women without education and with expressed need for contraception use a modern contraception method, compared to 62% in the most educated group. The proportion of children experiencing stunting is about 70% higher for children born to women with no formal education compared with those born to women with at least secondary education.
5. INEQUITIES IN ACCESS TO AND USE OF VARIOUS TYPES OF HEALTH SERVICES WITHIN AND BETWEEN COUNTRIES IN THE AFRICAN REGION

5.1 Introduction

The WHO African Region has the highest infant mortality rate in the world (estimated at 99 per 1000 live births in 2005, compared to a global average of 51 per 1000 live births). Less than half of the births in 2005 (46%) were attended to by skilled health personnel compared to the world average of 65% (World Health Statistics, 2009). A recent review of the public health situation across the WHO African Region – The Health of the People: the African Regional Health Report (WHO, 2006, hereinafter referred to as the 2006 report) – sends a clear message: African countries will not develop economically and socially without substantial improvement in the health of their people.

The 2006 report has examined some key public health issues that contribute to most deaths in the African Region. In general, mortality rate is universally regarded as one of the key indicators of health. Citing WHO statistics, the 2006 report revealed that there has been little or no improvement in maternal, newborn and child mortality in many parts of the Region since the end of the 1980s; and in some areas, advances made in the 1970s and 1980s have even been reversed. High mortality is also related to high fertility rates and low prevalence of contraception use in the Region, which underlines why family planning is essential. However, over the last decade it has become a neglected area of public health because of conflicting priorities, insufficient high-level political commitment and lack of donor interest, thus limiting policy and programme implementation. As a result, the rate of contraception use is only 17%. Malaria also contributes significantly to the maternal mortality ratio with estimated maternal deaths of 1000 per 100 000 live births each year. It is well established that malaria causes low birth weight; however, the distribution of bednets and antimalarial drugs during pregnancy in Africa is still very low.

Beyond the traditional health sector, safe water and sanitation are also essential to health. In 2002, 58% of the population of sub-Saharan Africa had access to a safe or improved water supply. Only UNICEF’s Pacific Region has a lower rate in the world. In contrast, the 2006 report notes that only 36% of the population in sub-Saharan Africa has access to adequate sanitation facilities compare to a worldwide average of 58%.

The 2006 report documents national health outcomes and their main causes and consequences in the Region. This new report extends the regional analysis on health inequalities within and across countries. Specifically, in order to better document potentially avoidable inequities, including different health outcomes across the Region and the socioeconomic determinants of these differences, this report carries out a
more in-depth analysis using publicly available Demographic and Health Surveys (DHS) from the African Region, as noted in the introductory section of the report. Part II of this report focuses on within-country differences, this part examines between-country differences.

A large number of countries show some improvement in both inequalities and averages in terms of DPT3 vaccination coverage, skilled birth attendance, and infant and under-five mortality rates based on DHS data. In contrast, a large number of countries show increasing inequalities in terms of children experiencing stunting and overweight women. Although national averages of modern contraception use among women with expressed need for contraception have improved to varying degrees over time in almost all of the countries, national averages mask increasing inequalities in most countries. This descriptive data provides a baseline to monitor the impact of future actions to address the root causes of inequities – social, economic and environmental determinants.

5.2 Magnitudes and Trends of Inequalities and Inequities in Access to and Use of Health Services and Health Outcomes Within and Between Countries in the African Region

Magnitudes of inequalities and inequities across and within countries

There is a wide range of between-country inequality in the indicators analysed (e.g., health services coverage, safe water and sanitation and health outcomes) within the Region. The evidence shows that there are some countries with a high level of a given indicator, some countries with a low level of that indicator and some countries in-between.

The pattern of inequality is not consistent across similar indicators (i.e. health system indicators) within countries - some countries have high coverage for one health intervention, but low coverage for another. For instance, Rwanda has a low proportion of skilled birth attendance (29%), but has the second highest rate of DPT3 vaccination coverage (73%) among countries studied. Also, Gabon has the highest prevalence of skilled birth attendance coverage (87%), but is among the countries with low DPT3 vaccination coverage (30%). Comoros shows the smallest difference (2%) in access to safe sanitation between the poorest and the richest quintiles; however, it is among the countries with the largest difference in access to safe water between the poorest and the richest quintiles. These and other examples suggest that no single indicator can fully capture inequalities or inequities. One explanation is that the root or underlying causes of health inequities differ for different types of health conditions or health system challenges. Understanding these different pathways from determinants to outcomes across countries also provides an understanding of the multiple opportunities to improve determinants that are common across the Region.

There is a wide range of within-country wealth-related inequity in indicators in the Region. For example, there are some countries with a big difference between the poorest and the richest wealth quintiles, some countries with a small difference and some countries in-between. Also, for some countries, differences by wealth quintiles may be more or less important than differences by educational level, place of residence, or between boys and girls.
Box 5.1 Important considerations when interpreting the results of magnitudes

- The data used are taken from DHS which were not conducted in the same year in all countries studied and range from 1995 to 2006. The current situation might have changed in countries with old DHS.
- Thirty countries in the Region with DHS in the public domain are represented.
- Inequity is the potentially-avoidable inequality across populations or sub-populations, and is measured by, for example, the absolute difference between the poorest and the richest quintiles.
- Only point estimates are shown and confidence intervals are not presented.

Trends of inequity and averages

Trends of inequity and averages are assessed for eight indicators (three for health services coverage and five for health outcomes) over five years. Countries show different patterns of change of inequity and averages over time for each indicator. A large number of countries show some improvement in both reducing inequity and increasing national averages in terms of DPT3 vaccination coverage, skilled birth attendance, and infant and under-five mortality rates. In contrast, a large number of countries show an increase in the prevalence of children experiencing stunting and overweight women. National averages in modern contraception use among women with expressed need for contraception indicate improvement in almost all of the countries, to different extents over time; however, this is associated with an increase of inequity in most of those countries. Given this descriptive data, national progress towards reaching agreed targets would benefit from integrating the distribution of service coverage or health outcomes. For example, 17 countries have documented improvements in coverage of skilled birth attendance, yet for 10 countries, this improvement in national averages masks increasing inequities between rich and poor households.

Box 5.2 Important considerations when interpreting the results of trends

- The period between two sequential surveys in each country is, on average, five years (in some cases, it is more or less than five years). The change of absolute inequity between two periods is adjusted by a time-correction factor (five divided by the number of years between the two surveys in each country) to take into account the length in time difference.
- The period of time during which the change is assessed depends on the time when the DHS was conducted in each country. It therefore differs from country to country. For example, while 1992 was the beginning of the assessment in Namibia, the beginning in Rwanda was in 2000. The starting time for the remaining countries was between these two years. This difference in the period of assessment among countries should also be taken into consideration when interpreting the data.
- The trend graphs illustrate the changes in inequity and national average over time. They do not show the magnitude of inequity/average at the beginning of the period. So, if there are some countries which have already improved greatly in terms of equity or average, there is not much room left for further improvement. The point is that the graphs can only show the latter, so the interpretation of the graphs should be accompanied by the information on the situation of inequity or average at the beginning of the period.
Table 5.1 summarizes the trends in the averages (of various indicators with data) and inequity, with ‘improved’ indicating an improvement, ‘worsened’ indicating a worsening of the situation, whether in national average or in terms of the degree of inequity, and ‘-‘ indicating no data for a particular indicator and country. The table covers the 20 countries in the Region with more than one survey in the public domain, as discussed in the methods section of this report.

**Table 5.1** Summary of national average and inequity trends for various health and process indicators (20 countries)

<table>
<thead>
<tr>
<th>Country</th>
<th>DPT3 vaccination coverage</th>
<th>Proportion of women attended to by skilled birth attendants during delivery</th>
<th>Modern contraception use by women with expressed need for contraception</th>
<th>Infant mortality rate (per 1000 live births)</th>
<th>Under-five mortality rate (per 1000 live births)</th>
<th>Prevalence of children experiencing stunting</th>
<th>Prevalence of women experiencing underweight</th>
<th>Prevalence of women experiencing overweight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Inequity</td>
<td>Average Inequity</td>
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**How to read the table:**

Take Benin for example. Under DPT3 the table shows that although there was an overall improvement in the national immunization rates, the degree of inequity between the rich and the poor worsened, meaning that, most likely, only the rich benefited from the observed increase in the average national immunization, etc.
5.3 Inequities in Access to and Use of Various Types of Health Services Within and Between Countries in the African Region

This section discusses in more detail improvement and worsening of national averages and within-country inequities for different indicators across countries. Given that the data used across countries do not come from the same year, inter-country comparisons may not be strictly valid. Nevertheless, wide variations exist within and between countries for different indicators.

**DPT3 vaccination coverage**

Based on the most recent survey year, DPT3 vaccination coverage ranges between 11% and 75% (a near seven times difference between Nigeria (11%) and Chad (12%) with the lowest coverage and Ghana with the highest coverage) (Figure 5.1). There is also a wide range of within-country inequity in DPT3 vaccination coverage favouring the richest quintile (least poor) in most of the countries. DPT3 vaccination coverage is between 3 and 57 percentage points higher in the richest quintile than the poorest one in these countries. Côte d’Ivoire (57 percentage points) and Niger (47 percentage points) are the countries with the largest difference between the poorest and the richest quintiles. In contrast, Kenya and Rwanda (the latter with second highest average of DPT3 vaccination coverage) display the smallest difference between the poorest and the richest quintiles, along with Namibia, Zimbabwe and Tanzania. In these three countries, DPT3 vaccination coverage is higher in the poorest quintile than in the richest one (7, 2 and 1 percentage points, respectively).

Figure 5.1 Inequities in coverage of DPT3 vaccination across and within countries in the African Region
Average DPT3 vaccination coverage and inequity in coverage have improved over time in a large number of countries (Figure 5.2). Benin, Cameroon and Mozambique are among the countries with a considerable decrease in the gap between the poorest and the richest quintiles. In contrast, there are two countries (Malawi and Zambia) where the average coverage and inequity in coverage have worsened. There are other countries in-between where the situation has improved for either inequity in coverage or average coverage. For instance, although there has been no measured reduction in inequity in coverage in Burkina Faso, it has achieved a big increase in average DPT3 vaccination coverage. On the other hand, Tanzania shows some reduction in the gap between the poorest and the richest quintiles over time; however, this is due to the worsening of coverage among all wealth quintiles which has lead to a huge decrease in average coverage.

**Figure 5.2** Trends in DPT3 vaccination coverage over a five-year period: Inequity versus average (19 countries in the African Region)

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Skilled birth attendance (SBA) coverage

Skilled birth attendance coverage ranges between 6% and 87% (a more than fourteen times difference between Ethiopia with the lowest coverage and Gabon (87%), South Africa (86%) and the Republic of Congo (84%) with the highest coverage). Chad and Niger have less than 20% SBA coverage.

There is substantial within-country inequity in skilled birth attendance coverage favouring the richest quintile (least poor) in all countries (Figure 5.3). Skilled birth attendance coverage is between 28 and 73 percentage points higher in the richest quintile than in the poorest one. Ghana, Madagascar and Mauritania have the biggest difference between the poorest and the richest quintiles while Ethiopia (lowest SBA average), Gabon and South Africa (highest SBA average) have the smallest difference between the poorest and the richest quintiles.

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1 Overall, this section discusses and illustrates each indicator in two ways. The first is based on the last survey year (and the gap between the richest, average and poorest quintiles). This figure usually has up to 30 countries (those with data for the indicator). The second is based on countries with more than one survey, and shows change or trend during a five year period. This figure, depending upon the indicator, has up to 19 countries. Therefore, the findings for the last survey year (Table 1) and the trend (Table 2) must not be the same.
Inequity in and average skilled birth attendance coverage have improved over time in half of the countries (Figure 5.4). Benin is among the countries showing the most marked improvement. In contrast, neither inequity in nor average SBA coverage has improved in Kenya and Madagascar. There are some countries where the situation has improved for either inequity in or average SBA coverage. Burkina Faso is one of the countries that show some improvement in SBA average coverage, but increasing inequity in SBA coverage.

Figure 5.3  Inequities in coverage of skilled birth attendance across and within countries in the African Region

Figure 5.4  Trends in skilled birth attendance over a five-year period: Inequity versus average (20 countries in the African Region)
Modern contraception use

Modern contraception utilization among women with expressed need for contraception ranges between 3% and 58% (a more than nineteen times difference between Chad with the lowest utilization rate and South Africa and Zimbabwe (57%) with the highest utilization rates). The Central African Republic, Guinea, Mauritania and Niger have utilization rates of less than 10%.

There is a relatively wide range of within-country inequity in modern contraception utilization among women with expressed need for contraception favouring the richest quintile in all countries (Figure 5.5). Modern contraception utilization is between 7 and 39 percentage points higher in the richest quintile than in the poorest one. Lesotho, Kenya and Burkina Faso have the biggest difference between the poorest and the richest quintiles (39, 36 and 35 percentage points, respectively) while Comoros and Chad (lowest average rate) have the smallest difference between the poorest and the richest quintiles (7 and 10 percentage points, respectively).

Figure 5.5 Inequities in current use of modern contraception (among women with expressed need for contraception) across and within countries in the African Region

Inequity in and average contraception prevalence rate among women with expressed need for contraception both have improved over time in a small number of countries (Figure 5.6). Namibia is among the countries that show a substantial reduction in inequity in contraception prevalence. There is no country that worsened both in terms of inequity in and average contraception prevalence. Most of the countries show an improvement in average prevalence, but also an increase in inequity in prevalence, to varying degrees. Mozambique stands out with an improvement in average prevalence and a small increase in the gap between the poorest and the richest quintiles. Malawi is the only country where average prevalence did not improve, but the gap between the poorest and the richest quintiles decreased.
Use of bednets by children

Use of bednets by children ranges between 2% and 52% among the 19 countries with data. Congo (52%) and Chad (51%) had the highest rates while use of bednets was less than 40% in the remaining countries. Ethiopia (2%), Namibia (4%) and Nigeria (6%) have the lowest utilization rates.

There is a wide range of within-country inequity in use of bednets by children favouring the richest quintile (least poor) in most of the countries (Figure 5.7). For example, in Ghana and Nigeria the poorest quintile has a higher rate of bednet use by children than the richest one (9 and 8 percentage points, respectively). There is no difference in use of bednets between the poorest and the richest quintiles in Burkina Faso. In the 16 remaining countries, use of bednets by children is between 2 and 42 percentage points higher in the richest quintile than in the poorest one. Tanzania and Kenya have the biggest difference between the poorest and the richest quintiles (42 and 33 percentage points, respectively). In contrast, Senegal and Chad (second highest average rate) have the smallest difference between the poorest and the richest quintiles but still in favour of the richest quintile (2 percentage points each).
Figure 5.7  Inequities in use of bednets by children across and within countries in the African Region

Use of bednets by pregnant women

Use of bednets by pregnant women ranges widely between 2% and 73% among the 19 countries with data. Mozambique (73%) and Congo (64%) had the highest rates while utilization is less than 40% in the remaining countries. Ethiopia (2%), Zimbabwe (3%) and Nigeria (5%) had the lowest utilization rates.

There is a wide range of within-country inequity in use of bednets by pregnant women favouring the richest quintile (least poor) in most of the countries (Figure 5.8). The poorest quintile in Burkina Faso, Ghana, Madagascar, Mozambique, Namibia and Nigeria has a higher rate of bednet utilization by pregnant women than the richest one. This difference ranges between 1 and 21 percentage points (in Madagascar and Mozambique, respectively). In the 10 remaining countries, use of bednets by pregnant women is between 1 and 51 percentage points higher in the richest quintile than in the poorest one. Tanzania has the biggest difference between the poorest and the richest quintiles. In contrast, Senegal and Uganda display the smallest difference between the poorest and the richest quintiles still in favour of the richest quintile (1 and 2 percentage points, respectively).
Use of antimalarial drugs during pregnancy

Use of antimalarial drugs during pregnancy ranges between 0% and 80% among the 19 countries with data. Thirteen countries have a utilization rate of less than 5%. The utilization rate is 1% or less in Burkina Faso, Cameroon, Chad, Ghana, Mali, Nigeria, Zambia and Zimbabwe. Malawi has the highest rate (80%) followed by Tanzania (53%) and Madagascar (44%).

There is little or no indication of within-country inequity in the use of antimalarial drugs during pregnancy in most of the countries mainly due to the very low utilization rate in the whole population of each country (Figure 5.9). A few countries including Guinea, Madagascar, Malawi and Tanzania show some evidence of inequity. For example, there is a 29 percentage point difference between the poorest and richest quintiles in Madagascar.
Figure 5.9  
Inequities in use of antimalarial drugs during pregnancy across and within countries in the African Region

Counselling for HIV during antenatal care

Counselling for HIV during antenatal care ranges between 6% and 52% among eight countries with data including Cameroon, Ghana, Guinea, Kenya, Mozambique, Nigeria, Senegal and Tanzania. The percentage of individuals counselled in Mozambique is more than eight times the percentage found in Senegal and Guinea (7%).

There is a wide range of within-country inequity in the counselling rate for HIV during antenatal care favouring the richest quintile (least poor) in all the eight countries studied. (Figure 5.10). The counselling rate for HIV during antenatal care is between 3 and 46 percentage points higher in the richest quintile than in the poorest one. Cameroon and Nigeria have the biggest difference between the poorest and the richest quintiles (46 and 41 percentage points, respectively) while Guinea and Senegal show the smallest difference between the poorest and the richest quintiles (3 and 9 percentage points, respectively).
Figure 5.10  Inequities in counselling for HIV during antenatal care across and within countries in the African Region

The same pattern of wide range of between-country wealth-related inequity exists in access to safe water and sanitation. Access to safe water ranges between 16% and 84% (a more than five times difference between the Central African Republic with the lowest coverage and South Africa with the highest coverage). There is the widest possible between-country inequity in the indicator for access to safe sanitation. At one end of the spectrum, 1.7% of households in Mauritania have access to safe sanitation whereas 99% of households in Comoros have access to safe sanitation.

The countries do not necessarily experience the same situation regarding access to safe water and sanitation, reflecting different root causes or determinants. For instance, households in Mauritania and Ethiopia have the lowest access to safe sanitation (1.7% and 3%, respectively); however, they are among the top half of countries in terms of access to safe water (62.4% and 61%, respectively). In contrast, while 66% of households have access to safe sanitation in the Central African Republic, it reports the lowest access to safe water (only 16% of households).

There is large within-country inequity in access to safe water favouring the richest quintile (least poor) in all of the countries (Figure 5.11). Access to safe water is between 34 and 89 percentage points higher in the richest quintile than in the poorest one. Comoros, Guinea, Kenya, Madagascar and Namibia have the biggest difference between the poorest and the richest quintiles (89 percentage points for the first two and 87 percentage points for the remaining two) while Niger has the smallest difference between the poorest and the richest quintiles, yet, in absolute terms, the inequity remains large.

Similarly, there is a wide range of within-country inequity in access to safe sanitation favouring the richest quintile (least poor) in all of the countries (Figure 5.12). Access to safe sanitation is between 2 and 100 percentage points higher in the richest quintile than in the poorest one. The Central African Republic, Madagascar and Namibia have a 100 percentage point difference between the poorest and the richest quintile, i.e. all of the households in the richest quintile and none of the households in the poorest quintile have access to safe sanitation. Comoros (with the highest average access to safe sanitation), Gabon and Mauritania (with the lowest average access to safe sanitation) and Ethiopia have...
the smallest difference between the poorest and the richest quintiles (2, 8, 9 and 10 percentage points, respectively). It is important to note that, although there are minimal differences in access to safe sanitation between the poorest and the richest quintiles in these four countries, nearly all the households in the first two countries have access to adequate sanitation while close to none of the households in the last two countries have access.

Figure 5.11  Inequities in access to safe water across and within countries in the African Region

Figure 5.12  Inequities in access to safe sanitation across and within countries in the African Region
5.4 Inequities in Some Selected Health Outcomes Within and Between Countries in the African Region

Infant mortality rate

The infant mortality rate (IMR) ranges between 38 and 123 deaths per 1000 live births across countries (a more than three times difference between Namibia with the lowest IMR and Niger with the highest IMR).

There is a wide range of within-country inequity in infant mortality favouring the richest quintile (least poor) in all of the countries with data (Figure 5.13). Infant mortality is higher in the poorest quintile (between 1 and 85 deaths per 1000 live births) than in the richest one. Nigeria and Côte d’Ivoire have the biggest difference between the poorest and the richest quintiles (85 and 72 deaths per 1000 live births, respectively). In contrast, based on survey data, Ghana and Zimbabwe have the smallest difference between the poorest and the richest quintiles (1 and 4 deaths per 1000 live births, respectively).

Figure 5.13 Inequities in infant mortality across and within countries in the African Region

Inequity in and average infant mortality rates improved over time in a number of countries (Figure 5.14). Burkina Faso is among those countries that document a major reduction in both inequity in and average infant mortality. Madagascar, Tanzania and Rwanda show a sizable decrease primarily in average infant mortality. There is a noticeable decrease in inequity in Cameroon, Guinea and Mali. On the contrary, there are only two countries characterized by worsening in both inequity in and average infant mortality. Côte d’Ivoire displays a considerable increase in inequity in and average infant mortality. There are some countries in-between where the situation improved for either inequity in or average infant mortality only. Ghana and Kenya are among this group showing a small increase in average infant mortality, but greater improvement in terms of inequity in infant mortality. In contrast, although Benin shows a small decrease in average infant mortality, it shows a considerable increase in inequity in infant mortality. Malawi is a country with a substantial reduction in average infant mortality but a small increase in inequity in infant mortality.
Figure 5.14  Trends in infant mortality over a five-year period: inequity in versus average infant mortality (20 countries in the African Region)

Under-five mortality rate

The under-five mortality rate ranges between 59 and 274 deaths per 1000 live births in the countries with data (a more than four times difference between South Africa and Namibia (62) with the lowest rate and Niger with the highest rate).

There is a wide range of within-country inequity in under-five mortality favouring the richest quintile (least poor) in all of the countries (Figure 5.15). Under-five mortality is between 2 and 143 deaths per 1000 live births higher in the poorest quintile than in the richest one. Nigeria and Côte d’Ivoire have the biggest difference between the poorest and the richest quintiles (143 and 139 deaths per 1000 live births, respectively). In contrast, Chad has the smallest difference between the poorest and the richest quintiles (2 deaths per 1000 live births). It is important to note that there is a considerable gap between the poorest and the richest quintiles in South Africa (71 deaths per 1000 live births) even though the country has the lowest average under-five mortality (59 deaths per 1000 live births).
The trend in under-five mortality is more or less similar to that of infant mortality. Inequity in and average under-five mortality rates have improved over time in more than half of the countries with data to different extents (Figure 5.16). Burkina Faso, Madagascar and Niger are among the countries that reflect a substantial decrease in both inequity in and average under-five mortality. The findings from Malawi show a significant reduction primarily in average under-five mortality. On the other hand, there is a noticeable decrease in inequity in under-five mortality in Mali. There are only three countries where inequity in and average under-five mortality worsened. Côte d’Ivoire is one country that had a large increase in inequity in and average under-five mortality. There are some countries in-between where the situation improved for either inequity in or average under-five mortality only. For example, Ghana and Kenya show small increases in average under-five mortality, but greater improvement in terms of inequity in under-five mortality. In contrast, although Benin shows a small decrease in average under-five mortality, there is a considerable increase in inequity in under-five mortality. Mozambique and Ethiopia are two countries that have a substantial reduction in average under-five mortality in spite of some increase in inequity in under-five mortality.
Figure 5.16  Trends in under-five mortality (over a five-year period): inequity in versus average under-five mortality (20 countries in the African Region)

Prevalence of children experiencing stunting

Although, in general, there is a high prevalence of stunting in children in the Region, it ranges between 16% and 48% (a three times difference between Senegal with the lowest prevalence and Madagascar and Malawi with the highest prevalence). The prevalence of childhood stunting in Chad, Ethiopia, Mozambique, Niger, Rwanda and Zambia is more than 40%.

The range of within-country inequity in childhood stunting favours the richest quintile (least poor) in all of the countries (Figure 5.17). Childhood stunting is between 7.7 and 29 percentage points higher in the poorest quintile than in the richest one. Burkina Faso and Cameroon have the biggest difference between the poorest and the richest quintiles (29 and 28.1 percentage points, respectively). In contrast, Niger has almost equally high prevalence of stunting across all of the wealth quintiles and therefore the smallest difference between the poorest and richest quintiles (7.7 percentage points).
Inequity in and average prevalence of stunting in children have improved to some extent over time in a few countries such as Kenya, Namibia and Tanzania (Figure 5.18). On the contrary, inequity in and average prevalence of stunting in children worsened in more than half of the countries. There are a few countries in-between where the situation has improved or not changed for either inequity in or average prevalence of stunting. For example, in Madagascar, there is an increase in inequity in children experiencing stunting between the poorest and richest quintiles, even though there is nearly no change in average prevalence of stunting in children. On the other hand, there is an increase in inequity in the prevalence of stunting in children in Ethiopia coupled with some decrease in average prevalence of stunting in children.
Modern contraception use

Underweight prevalence in women ranges between 6% and 26% (a more than four times difference between Lesotho with the lowest prevalence and Ethiopia with the highest prevalence). The prevalence of underweight women is more than 20% in Burkina Faso, Chad and Niger.

There is a range of within-country inequity in underweight prevalence in women favouring the richest quintile (least poor) in all of the countries (Figure 5.19). Underweight prevalence in women is between 1 and 21 percentage points higher in the poorest quintile than in the richest one. Kenya and Madagascar have the biggest difference between the poorest and the richest quintiles (21 and 19 percentage points, respectively). In contrast, Guinea, Mozambique, Rwanda, Senegal and Zimbabwe show the smallest difference (1 percentage point in Guinea and 3 percentage points in the others). It is important to note that while Madagascar and Senegal both have similarly high prevalence averages, Senegal is among the countries with the lowest inequity and Madagascar is among those with the highest inequity.

Figure 5.19  Inequities in prevalence of women underweight across and within countries in the African Region

Inequity in and average underweight prevalence in women have slightly improved over time in a few of the countries (Figure 5.20). Namibia is an example of this group with most noticeable improvement. On the contrary, inequity in and average underweight prevalence worsened to varying extents in a number of countries. This occurred in Burkina Faso, Tanzania and Zambia. There are a few countries in-between where the situation improved or did not change for either inequity in or average underweight prevalence in women. Mali is an example where average prevalence decreased yet inequity increased to a similar extent.
Overweight prevalence in women

Overweight prevalence in women ranges between 4% and 42% (a more than ten times difference between Ethiopia with the lowest prevalence and Lesotho and Mauritania (38%) with the highest prevalence).

There is a range of within-country inequity in overweight prevalence in women with greater prevalence among the richest quintile (least poor) in all of the countries (Figure 5.21). Overweight prevalence in women is between 9 and 35 percentage points higher in the richest quintile than in the poorest one. Ghana and Kenya have the biggest difference between the poorest and the richest quintiles (35 and 34 percentage points, respectively). In contrast, the Central African Republic and Ethiopia show the smallest difference (9 and 10 percentage points, respectively).
Figure 5.21  Inequity in prevalence of women overweight across and within countries in the African Region

Rwanda is the only country where neither inequity in nor average overweight prevalence in women worsened over time (Figure 5.22). On the contrary, the rest of the countries worsened in inequity, average or both to some extent. Benin is an example of a noticeable increase in both inequity in and average overweight prevalence in women. Zimbabwe shows a big reduction in inequity, accompanied by a small increase in average overweight prevalence.

Figure 5.22  Trends in overweight in women over a five-year period: Inequity in versus average overweight prevalence (19 countries in the African Region)
5.5 Decomposition of Inequalities – Factors Contributing to Inequities

The objective of this section is to identify factors and their contribution to the socioeconomic inequalities in maternal and child health in the Region. The analyses focus on determinants of skilled birth attendance and child malnutrition (under five years of age). Similar analyses can be conducted for a variety of other health indicators.

Child malnutrition is analysed using children experiencing ‘stunting’ - low height-for-age. This indicator is considered to be a good long-term indicator of the nutritional status of a population, since it represents a chronic and sustained lack of food. The framework described in Chapter 3 (section 3.1) is used to identify the pathways to and determinants of inequalities in health outcomes in the Region. Four broad domains encapsulating the pathways to health inequalities are identified in the framework:

- Geographical, socioeconomic and political context
- Socioeconomic position
- Differential exposures, vulnerabilities and consequences
- Health system factors

Table 5.2 highlights the major determinants that comprise the framework’s broad categories. The analytical approach described in section 1.3.1 was used to conduct a decomposition analysis of determinants of inequalities and inequities.

### Table 5.2 Major determinants identified under broad categories of the framework

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<tr>
<td>Area of residence (urban/rural)</td>
<td>• Wealth</td>
<td>• Water and sanitation</td>
<td>• Antenatal care (number of visits, quality of care, place of care)</td>
<td></td>
</tr>
<tr>
<td>Region (district, zone)</td>
<td>• Education (mother’s and partner’s)</td>
<td>• Mother’s biological characteristics (age, birth interval, body mass index)</td>
<td>• Barriers to accessing care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Occupation (mother’s and partner’s)</td>
<td>• Child’s biological characteristics (age, sex, birth weight, morbidity)</td>
<td>• Skilled birth attendance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Other social characteristics (sex of household head, relationship of mother to household head, marital status of mother)</td>
<td>• Child care practices (method of stool disposal, length of time breastfed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Decision on own health care</td>
<td>• Competition for resources (number of children)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Exposure to media</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Determinants in italics were only used for analysing determinants of child malnutrition.
Main factors associated with socioeconomic inequality in skilled birth attendance

The most recent data from 11 countries in the Region including Burkina Faso, Cameroon, Ghana, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Senegal, Tanzania and Zambia and were used to analyse determinants of socioeconomic inequality in skilled birth attendance.

Figure 5.23 Contribution of broad factors to inequalities in skilled birth attendance

Figure 5.23 shows an overview of the major factors that contribute to inequalities in skilled birth attendance. It shows that in each of the 11 countries, socioeconomic position accounts for at least half of the inequality in skilled birth attendance. The contribution of socioeconomic position (e.g. the extent to which the society is hierarchical or stratified) ranges from about 50% in Mozambique to about 78% in Madagascar. Based on the survey data, in Madagascar, the broader context is more favourable to poorer households and therefore has a negative contribution to socioeconomic inequality.

It can be noted in Table 5.3 that among the individual factors included in this analysis, household wealth is the biggest contributor to socioeconomic inequality in each of the 11 countries except for Malawi where mother’s education and area of residence have the same
contribution as household wealth. Other important factors include mother’s education in Cameroon, Kenya, Madagascar, Malawi, Mozambique, Rwanda and Zambia; partner’s education in Ghana, Malawi and Rwanda; regions in Cameroon, Ghana and Senegal; place of residence in most of the countries; valid antenatal care in Ghana and Madagascar; place of antenatal care in Mozambique; and quality of antenatal care in Burkina Faso, Cameroon, Tanzania and Zambia. The unequal distribution of each factor is associated with higher levels of inequalities in skilled birth attendance.

**Table 5.3 Percentage contribution to inequalities in skilled birth attendance of seven of the most common determinants in the 11 countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Wealth</th>
<th>Mother’s education</th>
<th>Partner’s education</th>
<th>Regions</th>
<th>Place of residence</th>
<th>Antenatal care</th>
<th>Place of antenatal care</th>
<th>Quality of antenatal care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burkina Faso</td>
<td>41.8%</td>
<td>4.7%</td>
<td>6.9%</td>
<td>4.0%</td>
<td>9.5%</td>
<td>2.6%</td>
<td>-</td>
<td>18.6%</td>
</tr>
<tr>
<td>Cameroon</td>
<td>23.9%</td>
<td>18.2%</td>
<td>6.8%</td>
<td>10.6%</td>
<td>14.6%</td>
<td>7.2%</td>
<td>-</td>
<td>10.0%</td>
</tr>
<tr>
<td>Ghana</td>
<td>35.1%</td>
<td>4.9%</td>
<td>11.0%</td>
<td>8.9%</td>
<td>16.4%</td>
<td>10.6%</td>
<td>5.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Kenya</td>
<td>34.8%</td>
<td>15.0%</td>
<td>5.1%</td>
<td>4.3%</td>
<td>5.0%</td>
<td>3.3%</td>
<td>7.7%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Madagascar</td>
<td>49.0%</td>
<td>14.8%</td>
<td>6.3%</td>
<td>-2.5%</td>
<td>-0.3%</td>
<td>9.7%</td>
<td>-</td>
<td>7.8%</td>
</tr>
<tr>
<td>Malawi</td>
<td>18.1%</td>
<td>18.6%</td>
<td>10.7%</td>
<td>1.2%</td>
<td>18.3%</td>
<td>4.5%</td>
<td>4.0%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Rwanda</td>
<td>43.4%</td>
<td>10.0%</td>
<td>9.1%</td>
<td>4.0%</td>
<td>5.8%</td>
<td>3.1%</td>
<td>-</td>
<td>6.8%</td>
</tr>
<tr>
<td>Senegal</td>
<td>37.7%</td>
<td>3.6%</td>
<td>1.8%</td>
<td>14.5%</td>
<td>18.8%</td>
<td>3.8%</td>
<td>-</td>
<td>4.9%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>35.8%</td>
<td>6.1%</td>
<td>6.8%</td>
<td>0.9%</td>
<td>14.3%</td>
<td>2.5%</td>
<td>2.2%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Zambia</td>
<td>44.1%</td>
<td>14.3%</td>
<td>6.1%</td>
<td>-2.1%</td>
<td>13.1%</td>
<td>3.9%</td>
<td>-</td>
<td>10.8%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>23.0%</td>
<td>13.3%</td>
<td>8.2%</td>
<td>-0.8%</td>
<td>11.5%</td>
<td>4.8%</td>
<td>17.6%</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

**Main factors associated with socioeconomic inequalities in children experiencing stunting**

Most recent data from five countries in the Region (Cameroon, Malawi, Rwanda, Senegal and Mozambique) are used to analyse determinants of inequalities in stunting. Figure 5.24 shows that socioeconomic position is responsible for between 62% and 82% of the inequality in stunting of children less than five years of age. Geographical, socioeconomic and political context plays an important role in Senegal and Rwanda while behavioural and biological factors make a large contribution in Cameroon and Senegal. Health system factors account for a relatively small proportion of inequities in stunting in all five countries.

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1 There is a difference in the results of the decomposition in childhood stunting in Mozambique between what is already published in the World Health Statistics 2007 and this report. The same model specification with similar variables used in this report enhanced comparability of the results. Given the high number of missing values for some variables in certain countries, the samples included in the model used in this report are limited to the last child/birth instead of all children under-five, in the method to estimate childhood stunting, and births are limited to those reported during the last five years prior to the survey date, in the method to estimate births with skilled birth attendants. The main reason for the observed difference is that in the previous analysis of childhood stunting in Mozambique, all children under-five were included in the model.
Figure 5.24 Contribution of broad factors to socioeconomic inequality in child malnutrition (stunting) in the five African countries

In Figure 5.24, the findings based on the data, suggest that health system factors contribute negatively to socioeconomic inequality in child malnutrition in Senegal, meaning that the individual health system factors are more favourable to poorer households.

5.6 Conclusion

The results of the analysis presented in this chapter and the previous chapter show widespread inequities. Depending on the country, between four and nine health outcome and health system indicators have been selected and analysed. These include infant and under-five mortality rates which are analysed by four stratifiers: wealth quintiles, area of residence, education and sex. Most countries show the same pattern for the last three factors: living in an urban area has lower mortality rates than residing in a rural area; higher education results in lower mortality rates; and males experience higher mortality rates than females. Further analysis of sex-disaggregated data from a gender perspective is warranted, for example, at the national level, and requires additional information. With respect to wealth, in general, the wealthier the respondent, the lower the mortality rate or the greater the access to services; however, the patterns across wealth groups are inconsistent. For example, some countries have highest mortality rates in the 3rd or 4th wealth quintile and in a few others, the richest group has higher mortality rates than the second richest group. This provides some evidence on the need to consider the entire social gradient when documenting health inequities and not only comparing the extreme groups.

1 For example, for South Africa only two indicators could be analysed, while for Cameroon, Malawi, Mozambique, Nigeria and Tanzania, up to nine indicators were analysed.

2 It is not clear why this is the case in some countries. Either (i) the “wealth index” we are using is imperfect to capture material differences among households; or, (ii) it may be due to the fact that relating “wealth” to, for instance, mortality does not take into account the “marginal” effect of “wealth” on mortality but only a partial, imperfect correlation. If other factors were considered (i.e. as in a multivariable model), this odd result would vanish.
The results generally show widespread inequities – within and between countries – with some countries showing a high level of a particular indicator and others a low level of that indicator, and others spread in-between these two levels. That is, some countries have a high level of coverage for a particular health intervention but may have a low coverage rate related to another intervention. More interventions requiring strong health systems for their scaling-up (e.g. skilled birth attendance) are more susceptible to disparity favouring the richest quintile.

According to the data, less infrastructure-dependent interventions, such as three-dose diphtheria, pertussis and tetanus vaccination (DPT3) coverage or bednet use, demonstrate less inequality or even favour the poor. The disproportionate burden of the socioeconomic determinants of poor health borne by the lower quintiles, as demonstrated in several decomposition analyses, combined with inadequate infrastructure allocation, is resulting in inferior access to more sophisticated health resources for this category of service users. There is also a wide range of within-country-related inequality in the indicators – some countries show marked differences between the poorest and the richest wealth quintiles and others only a small difference.
6. POLICY IMPLICATIONS AND RECOMMENDATIONS

6.1 Policy Implications of the Documented Inequalities and Inequities and Suggested Recommendations

Key findings. The extensive findings documented in this report identify deep, systematic and persistent disparities based on household wealth, location, education and sex, as markers for disadvantage and major barriers to progress in health. The report also shows that varying patterns of inequality and inequity exist within and across countries in the African Region. Patterns of deprivation vary depending on the indicator and across countries with much evidence of queuing and mass deprivation. However, analyses of the data across countries also reveal unexpected findings. Negative outcomes are not always confined to the poorest populations or those living in rural areas. For example, overweight prevalence is generally higher among the richest populations and prevalence of bednet use is higher among poorer populations and in rural areas in some countries.

Inequity in health is linked to wider disparities in the distribution of broader determinants of health, what the Commission on Social Determinants of Health has called “power, money and resources” that shape conditions of daily life. These are perpetuated by policies that either tolerate or actively exacerbate an unfair distribution of life chances - policies that, for example, fuel the transmission of poverty across generations. The findings from the decomposition analyses within this report indicate that a large percentage of the observed inequality in skilled birth attendance and childhood stunting is associated with socioeconomic inequality (e.g. wealth, education, partner’s education), inequality in health systems (e.g. quality of antenatal care), and place of residence (urban or rural areas). This helps to confirm that the inequalities across population sub-groups are, in fact, unfair, avoidable and inequitable and gives insight into the types of actions that can be taken to improve equity. Inequalities in health and access to health services of the magnitude documented in many countries are unacceptable. Apart from being inequitable, large disparities in health are inefficient: they hold back economic growth, social solidarity and progress in other areas.

Thus, the documented inequalities and inequities within and across countries in the African Region reinforce the need for Member States to address and put equity at the centre of all policies. Governments can do this by drawing on and strengthening mechanisms and partnerships not limited to the health sector. A starting point for Member States in this direction is the mainstreaming of health equity into their development agendas – at sectoral, national and regional levels – and working with development partners, civil society and local communities to move towards reducing health inequities through action on the underlying causes.

Mainstreaming health equity at sectoral level can be achieved through:

(i) Strengthening the institutional framework for supporting greater integration of health equity into health and other sector plans in order to ensure that the sectoral strategies prioritize health equity – this requires the identification of the equity-oriented goals and targets and the priority strategies needed to address health inequities in all sectors contributing to health.
(ii) Implementing measures that improve access to health services and health producing commodities/services by disadvantaged or excluded population groups – such as those designed to:

(a) improve geographical access, such as by strengthening the role of the NGOs and faith-based organizations that promote access to services in remote areas, and supporting documentation of the impact of their services;

(b) promote access to health services by the poor – such as the promotion of free or highly subsidized access to essential commodities and services, progressive financing measures that help increase equity in access, expansion of prepaid and other health insurance mechanisms or other pooling arrangements (including community-based health insurance) to improve the utilization of health services by the poor and other underserved populations.

(iii) Increasing public expenditure efficiency to improve the health of whole populations through measures that promote equity in resource allocation within the health sector (including resource allocation formulas that address health inequities – financial, human, etc); overall, these efforts should ensure that public funds and the programmes of these support are progressively redistributed to the population and support equity goals.

(iv) Improving monitoring and evaluation of health equity that requires disaggregated data by meaningful equity stratifiers within each country (e.g. place of residence, sex (enabling a gender analysis), social class, wealth, education, ethnicity, etc.), drawn from routine and specialized data sources, with national analysis capacities and communication to a diverse range of stakeholders.

The mainstreaming of health equity into national development agendas can be achieved through:

(a) Integrating prospective health equity impact assessments into the development of all relevant policies, including national development and poverty reduction strategies.

(b) Deliberate investments in rural areas (and poor urban areas such as slums) in infrastructure, personnel and other aspects of effective decentralized health services.

(c) Strengthening political leadership to address health equity including maintaining commitment from one government to the next as the time lag between policy action and measurable results is usually longer than typical political cycles.

(d) Integrating within-country distribution (by equity stratifiers) targets to monitor and report on progress on health-related MDGs.

(e) Following up with national reports and policy dialogues that outline options for improvement across different sectors.

The mainstreaming of health equity into regional and subregional processes will require:

(a) Collaboration with regional institutions to mobilize the resources necessary for addressing health inequities at the regional and subregional levels.

(b) Promoting policy dialogue among Member States through policy guidelines and advocacy.

(c) Building capacity to generate and use disaggregated data for monitoring health equity across the Region, including availability of data in the public domain.
(d) Developing effective intercountry mechanisms for sharing best practices or experiences on policies, strategies, data and other resources for mainstreaming health equity.

(e) Enabling and encouraging civil society and nongovernmental organizations to participate in policy dialogues, programme implementation and monitoring of progress.

**Possible entry points – where to start.** There is a wide range of entry points and interventions which Member States can undertake that reflect the framework introduced in section 3.1. Some will address upstream or structural factors and other downstream factors such as individual risk factors. Structural determinants include the socioeconomic and political context, such as employment conditions, social and health policies, welfare systems, social and spatial environments and living standards which in turn define social position based on income, education, occupation, class, gender and ethnicity. Intermediate determinants consist of material, psychosocial, biological and behavioural factors and the way the health system in each country is designed. Structural factors define the position of an individual in society which influences exposure and vulnerability levels, including physical working conditions, health behaviours and access to effective health care. Together, these factors explain the differences in health status across the social scale and offer entry points to introduce equity-enhancing policies and interventions.

Supported by pro-equity legal frameworks, national policies and budgetary allocations, measures can target individuals, population groups, and a mix of the two, as discussed below.

- **Improving health of the worst off:** there is an urgent need for both countries and development partners to give priority to efforts to reduce poverty. The evidence provided in this report points to a powerful connection between poverty and ill-health, running in both directions. Targeting the poor, an oft-prescribed strategy, may not be adequate, because inequities are not about the plight of the most deprived in societies. Strategies aimed at improving health and reducing poverty and inequities (including wealth inequities) must recognize this connection. Yet, it is important not to lose sight of the intrinsic value of alleviating poverty and ill-health, particularly as the pattern of mass deprivation is frequently found in the Region. This report documents that the better-off are much more likely to obtain access even though the worst off need the services more. Poverty and ill-health impair the ability of individuals to realize their own goals and their capacity to reach those goals – and redressing that damage cannot be reduced to the economics of wealth creation.

Interventions focusing on the poorest parts of the population (or the country) may include measures to improve educational performance, housing, health behaviour, in addition to pro-equity legal frameworks. The key to reducing overall child malnutrition and disparities by wealth level includes improving food and income security of the poorest households in all the countries of the Region. These interventions do not necessarily have an impact on the health gap between low and high socioeconomic groups because the overall population health may be improving faster. Their effectiveness would be gauged by a comparison of health indicators before and after the intervention. Ideally, there should be an absolute improvement in health and the distribution of its key determinants. However, it should be noted that there might be a delay between the implementation of interventions and impact of outcomes.

- **Addressing the disparity in health status between the richest and the poorest:** interventions to address the health needs of the poorest (which include the measures mentioned above) are central here. However, it is not only important that they change health and its determinants over time but that improvements (in the health of the poorest) are sufficiently rapid compared to the other groups. This is so as the poor need health services much more than the rich. Only then can the gap in health and health determinants between the poorest group and the best off or the average population be closed. Given that improvements have been documented for some
indicators and countries (e.g. higher utilization of bednets among the poorest and in rural areas), the African Region cannot accept that inequities are inevitable or unavoidable. The ‘groups’ could also be regions – e.g. urban versus rural, or pockets of deprivation within regions, such as slum areas in urban areas, or displaced persons. To evaluate these programmes, there is need for information on the health improvements in the target group and the comparison group, as well as the establishment of a reliable monitoring and evaluation system, capable of tracking inputs and relating these to outcomes.

In general, improving overall access to health services and moving towards universal access are likely to reduce socioeconomic inequities for most indicators of health system use and access and, in the case of outcomes which are strongly related to access such as maternal mortality, reduce their disparities too. The provision of public sector maternal care services in many countries of the Region has not been sufficient to reduce inequities in access to maternal care. It is therefore necessary for countries to focus on identifying and mitigating the factors that prevent poor mothers from accessing public services. Whilst health system factors and inequities lie behind most health inequities, social and economic factors explain a large amount of many health inequities, and health policies must take into account these factors, such as gender-based discrimination and harmful practices, and attempt to alleviate these where possible, or lead efforts for intersectoral action where necessary.

Addressing the social gradient and its persistence over time - the disparity between social classes and across the spectrum of advantage and disadvantage: the analysis over time shows that many large gaps persist, and some inequities are widening, pointing to systematic constraints and long-term barriers. Interventions that target the poorest and groups in the middle of social stratification require structural changes, as well as the measures mentioned above. But these must have a greater positive impact on those who are worse off in order to decrease the disparity between social classes. This can be achieved by a combination of structural and population-based interventions and additional services for poorer regions, communities, families or individuals. It is therefore important to have information on health improvements in all socioeconomic groups to evaluate such impact. Moreover, public spending on health, in particular spending on secondary and tertiary hospital-based services, has not been analysed in this report.

It is important to note that there is no “gold standard” for tackling health inequities. Promoting the health of the worst off, closing the health gap between the worst off and comparison groups, reducing the persistent health gradients across society, or a mixture of all three, depend on the specific situation, the sources or root causes of inequities and the needs of populations within and across countries.

Where and how to act. The Commission on Social Determinants of Health and other writers have proposed frameworks for tackling inequalities in health that address the “causes of causes”\(^1\) and outline a process to inform policy formulation and refinement in countries. Every proposed intervention to tackle health inequalities starts with the recognition of a problem and measurement of the extent of the problem to which this report has contributed. When a decision is taken that ‘something must be done’ about that problem, the nature of the proposed action – such as better allocation of resources – will depend on the prevailing notions of what is causing the problem. Causes are the link between the problem and evidence-based policy design. These notions of the causes of the problem will in turn govern the choice of interventions to tackle the causes. The interventions proposed are based on pathways between root causes and the problem identified, taking into account local constraints and institutions. Evidence from across the African Region, and other countries, can play a crucial role in the development of policies and interventions. Regional experience will build up the evidence base on how and why proposed interventions might work, what their expected effectiveness could be, and inform national policy dialogues with multiple stakeholders. On-going monitoring of interventions

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and their actual impact in terms of national averages and distribution across all population sub-groups are required, given the complex and contextual nature of the inequalities and inequities that have been well described in this report.

Four main categories of interventions to tackle health inequalities are identified. Each category has a distinct aim, including strengthening individuals and communities, improving living and working conditions and promoting healthy macro-policies. Policy dialogues could consider the role of the health sector, other public sectors and other stakeholders outside of government, given that many determinants of health are outside of the health sector and capacities to address them might be outside of public services. This approach could inform policy options when governments propose interventions designed to address social, economic or environmental determinants of health and the related health inequities. The key findings of the Commission on Social Determinants of Health affirm this approach (see Box 1). Moreover, the Commission’s report makes three overarching recommendations: (i) Improve daily living conditions; (ii) Tackle the inequitable distribution of power, money and resources; and (iii) Measure and understand the problem and assess the impact of the action.

Under these overarching recommendations, the Commission presents action areas and specific recommendations aimed at all sectors, including WHO, other multilateral agencies, national and local governments, civil society, the private sector and research institutions. Each government can develop a comprehensive strategy that builds on current policies and programmes, local innovations, and options based on favourable experiences from other countries.

**Box 6.1 Key Findings of the WHO Commission on Social Determinants of Health**

- There are increasing health inequities both within and between countries. There is a gap of over 40 years between the countries with the lowest and highest average life expectancies. Moreover, there are gross inequities between the health statuses of different groups of people within all countries, regardless of income level. In high income countries, life expectancy gaps of more than a decade exist between different groups according to factors such as ethnicity, gender, socioeconomic status and geographical area. In low income countries in all regions, there are marked differences in child mortality related to level of household wealth.

- Such health inequities are not an inevitable phenomenon. Instead, they are mostly markers of policy failure, reflecting inequities in daily living conditions and in access to power, resources, and participation in society.

- It is necessary to address social determinants to achieve many disease-specific targets, including the health-related Millennium Development Goals (MDGs) and to control and eliminate epidemics that put the entire population at risk. Most priority public health conditions share key social determinants, including determinants of exposure to risk factors, disease vulnerability, access to care, and the consequences of disease.

- Many opportunities exist to address these determinants collectively, both within and outside the health system. Coordinated action across public health conditions within strong systems based on primary health care is therefore needed to realize the MDGs and reduce health inequities as well as make improvements in overall population health.

6.2 Challenges to Developing, Implementing and Evaluating Solutions

In developing, implementing and evaluating programmes and policies to ameliorate health inequities, countries in the Africa Region will face at least two specific challenges. The first challenge is developing appropriate goals and objectives and finding suitable evaluation methods, on the basis of the types of questions asked and the potential audiences for the evaluation results. The second challenge is determining which strategies will ensure the greatest impact.

In developing goals and objectives, countries must recognize that no single programme is going to accomplish the ultimate goal of eliminating health inequities, and that the goals and objectives of a particular programme should realistically reflect the potential impact of that programme. For example, although the ultimate goal is to eliminate (between and within country) inequities in infant mortality rates, we cannot expect this goal to be achieved through a single three-year programme aimed at one of the many determinants of these inequities. It is critical that countries be clear and realistic about what they expect to achieve through specific programmes or actions, beginning with a discussion of methods that can help them understand and meet social and political challenges. Moreover, it would be beneficial for countries to develop methods to document the specific steps they took (what worked and what barriers they faced) as well as the intended and unintended consequences of their actions.

One of the challenges in developing programme goals and evaluation methods is that the information used to define a problem (e.g. statistics gleaned from routine or specialized data collection sources, such as surveillance systems or hospital records) is limited when it comes to identifying appropriate solutions or when tracking change. It is important that public health practitioners learn to use alternative methods such as qualitative data/information to define problems and document change. Improving the methods of documentation will help not only to more effectively document the impact of efforts to reduce inequalities but also to make more informed decisions about future courses of action.

In addition to considering multiple methods of documenting programme results, governments can maintain some flexibility as there are different indicators of “success” and the relative importance of these different indicators to different stakeholders may vary. Long-term support for any programme depends on providing stakeholders with the information they will need to evaluate the success of that programme from their perspective as well as helping them have realistic expectations of the programme so they will not be disappointed by a lack of immediate change. Governments will benefit from working together with all stakeholders to outline the steps required to reach equity goals and to track movements towards them. They also need to work with the media to better illustrate the social and economic basis of many health inequities.

The best strategies for ameliorating inequities in social determinants of health are those that reflect local knowledge, innovation and a community’s readiness for change, not just “expert” knowledge regarding the best way to create change. One of the most important trends in public health is the inclusion of those who experience health inequities in all aspects of work; however, this means that attempts must be made to identify and engage all subgroups affected by health inequities and ensure that they have the opportunity to fully participate once at the table. A great deal of work suggests, for example, that within various ethnic and racial groups there are significant differences in perspectives and experiences depending on class gradations, occupational category and gender. The challenge is incorporating this broad range of perspectives.

In addition to engaging a representative group of community partners, there is also need to solicit input from health practitioners and from experts in diverse fields, including education, business, housing and transportation. Including multiple perspectives requires governments to reconsider the assumption that their current methods of planning, assessment, implementation, evaluation and dissemination are the best methods for addressing health-related issues and to at least be open to the possibility that these methods may not be sufficient for addressing many inequities in the social, economic or environmental determinants of health.
GLOSSARY OF KEY TERMS

**concentration index:** A statistical approach used to summarize the degree of inequality across all sub-population groups and confirm comparisons which are made based on the simpler ratio measure. It is a summary measure of the distribution of health across the full spectrum of socioeconomic stratifiers.

**decomposition:** An approach used to identify and understand what factors are contributing to the observed inequalities in health and health care.

**exclusion:** A pattern of inequity in which the prevalence of a health outcome is relatively low in the majority of the population but much higher in a poor deprived minority.

**health equity:** The absence of systematic and potentially-remediable differences in one or more aspects of health across population groups defined socially, economically, demographically, or geographically.

**health inequalities:** Generic term to describe differences in levels of health achievements across individuals in a population. This includes both unavoidable (e.g. due to biological differences) and potentially-avoidable inequality.

**health inequities:** Differences in one or more aspects of health (e.g. coverage, access, status, etc.) across populations or population groups that are systematic, socially produced and unfair. This can also be thought of as potentially-avoidable inequality.

**mass deprivation:** A pattern of inequity within a population where a negative health outcome (e.g. children experiencing stunting) is highly prevalent for the majority of the population, with a small privileged group or elite class with a low to no prevalence.

**queuing:** A pattern of inequity in which the prevalence of a negative health outcome is inversely proportionate to increasing wealth (or education), illustrating a social gradient.

**ratio:** This measure compares the occurrence of a health outcome like child mortality between two groups within an equity stratifier (e.g. between female and male, lowest and highest socioeconomic groups, urban and rural areas, etc).

**social gradient:** A systematic phenomenon in which individuals of poor socioeconomic status (e.g. income, education, occupation) have poorer health outcomes or less access to health services, than those of higher socioeconomic status; the gradient shows a stepwise relationship across all levels of the selected stratifier.

**stratifier:** A measure of social position or advantage that defines strata in a social hierarchy (e.g. socioeconomic status, gender, ethnicity and geographical area) that contains two or more levels. For example, one input to gender analysis is sex-disaggregated data, among other inputs.
Annex 1: List of countries with DHS data included in this analysis

<table>
<thead>
<tr>
<th>Country</th>
<th>Year*</th>
<th>Datasets available publicly</th>
<th>Used in AFRO report</th>
<th>Descriptive part</th>
<th>In-depth part</th>
</tr>
</thead>
<tbody>
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* The bold numbers under the “year” column indicate the survey included in this assessment.
** Indicates that a more recent DHS may have taken place, but data has not been released yet.
**BIBLIOGRAPHY**


Armar-Klemesu M et al (2000), “Poor maternal schooling is the main constraint to good child care practices in Accra”, *Journal of Nutrition*, vol. 130, No. 6, Bethesda, Maryland, American Society for Nutrition.


