

Towards universal health coverage: the role of within-country wealth-related inequality in 28 countries in sub-Saharan Africa

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Objective To measure within-country wealth-related inequality in the health service coverage gap of maternal and child health indicators in sub-Saharan Africa and quantify its contribution to the national health service coverage gap.

Methods Coverage data for child and maternal health services in 28 sub-Saharan African countries were obtained from the 2000–2008 Demographic Health Survey. For each country, the national coverage gap was determined for an overall health service coverage index and select individual health service indicators. The data were then additively broken down into the coverage gap in the wealthiest quintile (i.e. the proportion of the quintile lacking a required health service) and the population attributable risk (an absolute measure of within-country wealth-related inequality).

Findings In 26 countries, within-country wealth-related inequality accounted for more than one quarter of the national overall coverage gap. Reducing such inequality could lower this gap by 16% to 56%, depending on the country. Regarding select individual health service indicators, wealth-related inequality was more common in services such as skilled birth attendance and antenatal care, and less so in family planning, measles immunization, receipt of a third dose of vaccine against diphtheria, pertussis and tetanus and treatment of acute respiratory infections in children under 5 years of age.

Conclusion The contribution of wealth-related inequality to the child and maternal health service coverage gap differs by country and type of health service, warranting case-specific interventions. Targeted policies are most appropriate where high within-country wealth-related inequality exists, and whole-population approaches, where the health-service coverage gap is high in all quintiles.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

Introduction

Established in 2000, the eight Millennium Development Goals (MDGs) represent a global commitment to eliminating poverty. MDG 4 and MDG 5 are devoted to child and maternal health, with 2015 targets of a two-thirds reduction in the 1990 mortality rate for children under 5 years of age, a three-quarters reduction in the 1990 maternal mortality rate and universal access to reproductive health services.^{1,2}

Although some promising gains have been made worldwide, in 2008, about 358 000 mothers³ and 8.8 million children under 5 years of age⁴ lost their lives, many from preventable or treatable causes.^{3–5}

The African Region of the World Health Organization (WHO) is falling behind on MDG child and maternal health targets. In many countries these are advancing too slowly, stagnating or deteriorating.^{1,3–9} Between 1990 and 2008, the worldwide mortality rate for children under 5 years of age dropped by 27%;⁸ however, in 2008 more than half of these deaths occurred in sub-Saharan Africa.^{5,8} The maternal mortality ratio in the African Region is 900 maternal deaths per 100 000 live births – at least double that of any other WHO region.⁸ Access to services such as antenatal care and skilled birth attendance in the African Region are among the lowest in the world.^{1,3–6,8}

Improving child and maternal health requires health systems to be strengthened through both long-range investments (e.g. development of health facility infrastructure and programmes to train health workers) and initiatives that can be rapidly deployed (e.g. community immunization days,

vitamin A campaigns and distribution of insecticide-treated bednets).^{4,10,11} In 2010, the *Countdown to 2015 decade report* made a special appeal for improving the child and maternal health situation in sub-Saharan Africa, calling for renewed and accelerated political and financial commitment to MDG 4 and MDG 5 in this region.⁴

Achieving the child and maternal health MDGs will require policy and programme planners to identify and reach those who are most in need of health services.^{2,5,9} To maximize and improve progress towards the MDG targets in Africa, it is important to have strong national and regional monitoring systems¹² that can identify which populations are benefiting from programmes and initiatives, and which are not.¹³ Progress on MDG 4 and MDG 5 has been variable across sub-Saharan African countries; also, national indicators may mask inequalities between subgroups of the population,^{4,6,8} and improvements at a country level may occur alongside a widening inequality gap.¹⁴ Addressing inequalities and their root causes is an important step towards improving health outcomes.⁵

Measurements of service coverage capture both provision and use of services and interventions, since they express the percentage of people receiving a specified service or intervention among those requiring that service.¹³ The health service coverage gap represents an estimate of the increase in coverage needed to achieve universal coverage for a given service.¹⁵ The ability of a programme or initiative to reduce the health service coverage gap is an important indicator of success; comparing the gap across populations can help to target action to reduce disparities.^{13,15}

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Previous monitoring of health service coverage and the health service coverage gap for several child and maternal health services revealed between-country inequality and varying patterns of within-country wealth-related inequality.^{15,16} Further delineation of the coverage gap within countries is needed to more accurately define the current reach of child and maternal health services and to inform programme and policy direction.^{17–19} Thus, our objective was to measure the magnitude of within-country wealth-related inequality in the health service coverage gap of maternal and child health indicators and to quantify the contribution of this inequality to the national coverage gap within sub-Saharan African countries.

Methods

Coverage data for child and maternal health services were obtained from the 28 sub-Saharan African countries that participated in the Demographic Health Survey (DHS) between 2000 and 2008.⁴ This sample included 13 of the 15 African countries with the highest number of neonatal deaths.⁹ The DHS is a large-scale, nationally representative survey that conducts standardized face-to-face interviews with women aged 15–49 years.²⁰ Where countries had multiple DHS data sets for the 2000–2008 period, we selected the most recent set for analysis.

We used an index of several health services to display an overview of the child and maternal health service coverage gap within each study country. The index – referred to as the overall coverage gap – captured the coverage gap in four areas of intervention with different delivery strategies: maternal and neonatal care, immunization, treatment of sick children and family planning. Each of the four interventional areas comprised a small number of indicators for which reliable long-term and comparable data were available. The validity of the index has been discussed previously; it performed well in comparison to several alternative measures.¹³ To further illustrate select components of each of the four areas of intervention included in the index, we calculated coverage gaps separately for the following health service indicators: skilled birth attendance; one or more antenatal care visits; measles immunization; receipt of a third

dose of vaccine against diphtheria, pertussis and tetanus (DPT3); treatment of acute respiratory infection in children under 5 years of age; and family planning. These interventions represent diverse types of child and maternal health services and interventions, and are associated with a range of aspects of health system delivery.¹³

For each country, the national coverage gaps were calculated and additively broken down into two parts: the coverage gap in the wealthiest quintile (i.e. the proportion of this quintile that did not receive a required health service) and the population attributable risk (an absolute measure of within-country wealth-related inequality that summarizes the differences between the richest quintile and each of the four other wealth quintiles). Thus, population attributable risk, PAR, shows the improvement possible if the total population had the same health service coverage as the wealthiest quintile. PAR can be expressed as follows:

$$PAR = CG_{pop} - CG_{ref}$$

where CG_{pop} is the average coverage gap across all wealth quintiles (the population), representing the national coverage gap, and CG_{ref} is the coverage gap in the wealthiest quintile (the reference group).^{18,21,22} The relative version of population attributable risk – population attributable risk percentage – is calculated by dividing population attributable risk by the national coverage gap. It indicates the proportional reduction in national coverage gap that would be achieved if the total population had the same health service coverage gap as the wealthiest quintile.

Results

The national overall coverage gap ranged from 24% (Namibia) to 77% (Chad), with a median of 43% (Fig. 1). In 26 of the 28 countries, within-country wealth-related inequality constituted at least one quarter of the national overall coverage gap (Table 1). In four countries – Burkina Faso, Madagascar, Mozambique and Nigeria – within-country wealth-related inequality accounted for about 50% of the national overall coverage gap. The lowering of wealth-related inequality had the potential to decrease the national overall coverage gap by

levels of between 16% (Swaziland) and 56% (Madagascar).

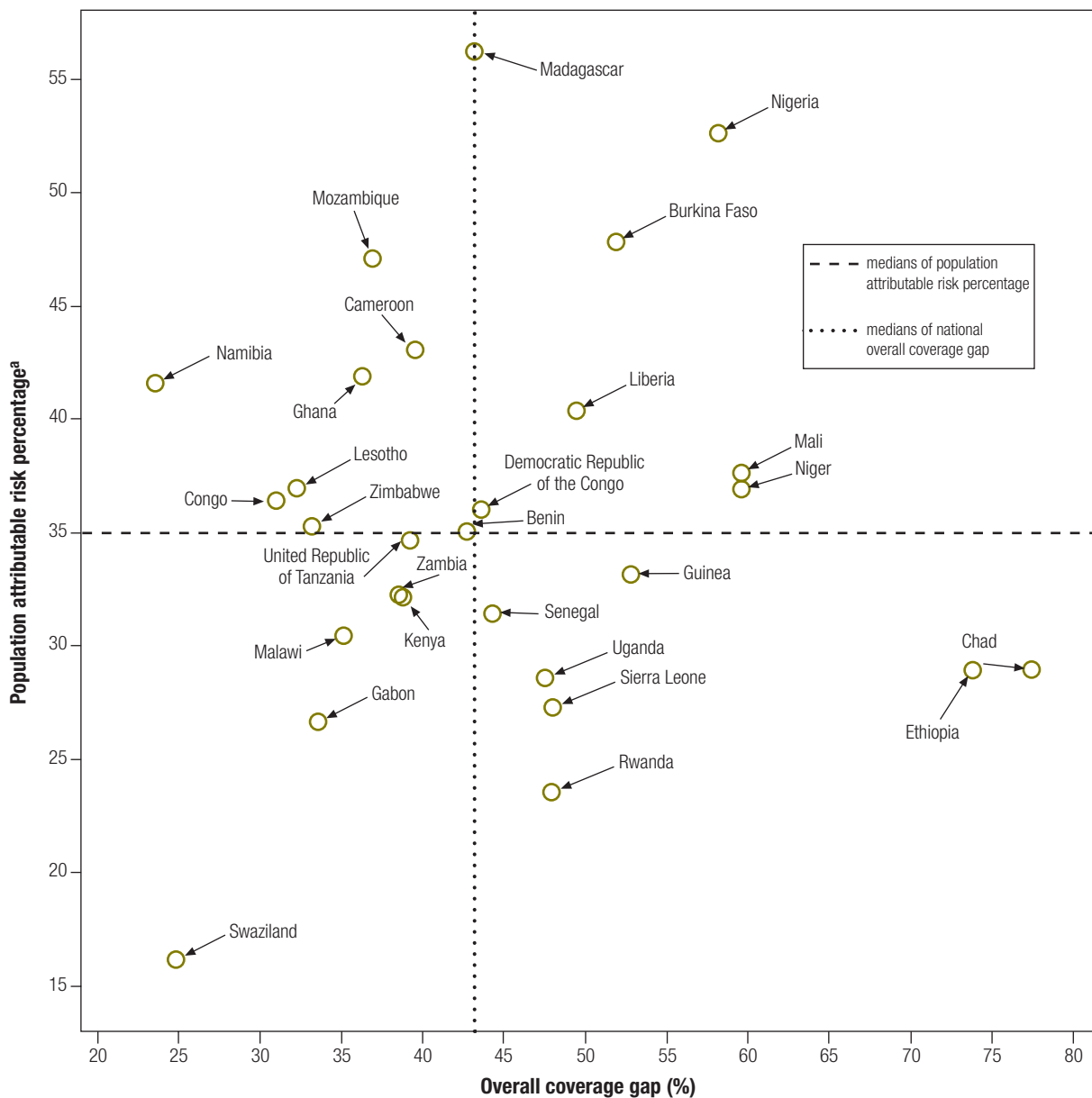
Fig. 1 demonstrates the national overall coverage gap against the wealth-related relative inequality in overall coverage gap observed within each of the 28 study countries. There was no relation between the two parameters (ρ : 0.03; P -value: 0.88).

The relationship between wealth and coverage gaps for specific indicators varied, depending on the type of health service. Breakdown of the national health service-specific coverage gaps revealed that within-country wealth-related inequality was particularly important for some components of the overall coverage gap (e.g. skilled birth attendance and one or more antenatal care visits) (Table 2). The coverage gap in skilled birth attendance generally showed a high proportion of within-country wealth-related inequality. Depending on the country, the coverage gap in skilled birth attendance could be reduced by 22% to 93% if no wealth-related inequality existed. For 25 of the 28 countries in the study, eliminating the wealth-related inequality would at least halve the coverage gap for skilled birth attendance. Similarly, within-country wealth-related inequality in one or more antenatal care visits accounted for at least 50% of the coverage gap in 21 countries.

For some health services, the role of within-country wealth-related inequality was less pronounced. For example, such inequality accounted for a smaller proportion of the national coverage gap in measles immunization, DPT3, care seeking for suspected pneumonia, and family planning (Table 3), with some notable variations. The national DPT3 coverage gap was 64% in both Nigeria and the United Republic of Tanzania; however, within-country inequality accounted for only 3% of the coverage gap in the United Republic of Tanzania but 63% of the gap in Nigeria. Both Cameroon and Zimbabwe had a 34% national coverage gap in measles immunization but differed widely in terms of within-country inequality contribution to the national coverage gap (53% in Cameroon and 24% in Zimbabwe).

The 28 countries had different magnitudes and patterns of wealth-related inequality. Ethiopia had one of the highest coverage gaps for every indicator in the study, yet the contribution of within-country inequality

Fig. 1. National overall health service coverage gap versus within-country relative inequality in 28 sub-Saharan African countries, 2000–2008



^a Relative inequality, calculated by dividing population attributable risk by the national health service coverage gap.

tended to be proportionally low. Nigeria had high within-country wealth-related relative inequality for many indicators. In many other countries the situation was mixed. For example, in Mali, within-country wealth-related inequality constituted at least two thirds of the national coverage gap in both skilled birth attendance and one or more antenatal care visits, but only about one third of the national coverage gap in measles immunization.

Discussion

This study of 28 sub-Saharan African countries concurs with other reports

in finding that health services in developing countries are not equally accessible to all populations.^{4,9,12,14,18,23–25} By breaking down the health service coverage gap, we showed that the role of wealth-related inequality differs between countries and types of health service. Even within the same region, countries experience many unique factors that affect health service coverage both directly and indirectly, ranging from health-care financing priorities and political agendas to cultural practices and conflict situations.^{12,24}

Health services require variable amounts of funding, resources and infrastructure, and this may account

for some of the differences in the role of wealth-related inequality.^{4,23} In line with other studies, we found that within-country wealth-related inequality contributed less to the services delivered at the community level (e.g. family planning and immunizations) than to services that require trained health professionals or health facilities (e.g. one or more antenatal care visits and skilled birth attendance).⁴ An understanding of the complexity and magnitude of wealth-related inequality will improve interventions that aim to increase the coverage of child and maternal health services in developing countries.

Table 1. Overall health service coverage gap – national average versus within-country inequality in 28 sub-Saharan African countries, 2000–2008

Country	Year	Coverage gap (%)		PAR ^a (percentage points)	PAR% ^b
		National	In richest quintile		
Benin	2006	43	28	15	35
Burkina Faso	2003	52	27	25	48
Cameroon	2004	39	22	17	43
Chad	2004	77	55	22	29
Congo	2005	31	20	11	36
Democratic Republic of the Congo	2007	44	28	16	36
Ethiopia	2005	74	52	21	29
Gabon	2000	34	25	9	27
Ghana	2008	36	21	15	42
Guinea	2005	53	35	17	33
Kenya	2003	39	26	12	32
Lesotho	2004	32	20	12	37
Liberia	2007	49	30	20	40
Madagascar	2003–2004	43	19	24	56
Malawi	2004	35	24	11	30
Mali	2006	60	37	22	38
Mozambique	2003	37	19	17	47
Namibia	2006–2007	24	14	10	42
Niger	2006	60	38	22	37
Nigeria	2008	58	28	31	53
Rwanda	2005	48	37	11	24
Senegal	2005	44	30	14	31
Sierra Leone	2008	48	35	13	27
Swaziland	2006–2007	25	21	4	16
United Republic of Tanzania	2004–2005	39	26	14	35
Uganda	2006	48	34	14	29
Zambia	2007	39	26	12	32
Zimbabwe	2005–2006	33	22	12	35
Median	2000–2008	43	27	14	35
95% CI of the median	2000–2008	37–48	23–30	12–17	32–37

CI, confidence interval; PAR, population attributable risk.

^a Absolute inequality.

^b Relative inequality, calculated by dividing population attributable risk by the national health service coverage gap.

Note: Figures may be affected by rounding.

Planning interventions

Planning interventions that take into account wealth-related inequality may play a significant role in reducing the health service coverage gap. Where the contribution of within-country wealth-related inequality is high, an approach targeted at populations in lower wealth quintiles is justified. This type of approach would be appropriate in countries such as Madagascar and Nigeria, where the relative inequality (PAR%) is high. The use of poverty maps and the prioritization of poor, remote communities in the design of health service delivery have helped countries such as Bangladesh, Brazil and Peru to tackle health service coverage inequality.^{26,27}

In many of the study countries, a targeted approach may be appropriate for interventions in skilled birth attendance or one or more antenatal care visits. Such an approach could include providing free or reduced-fee health services to those in lower wealth quintiles, creating incentives for health workers to practice in underserved communities, offering skill development sessions to build the capacity of health-care providers serving poor communities, or establishing conditional cash-transfer programmes that pay mothers for using services.¹⁸ Task-shifting – the deployment of community health workers outside of health facilities – is another low-cost way to increase access to basic health services.^{14,28}

A whole-population approach may work well in situations in which the national coverage gap is high, as is the case for Chad and Ethiopia. Given the widespread coverage gap in all quintiles (including the richest), there is great potential for these countries to benefit from a whole-population approach. In situations where the health system can reach the entire population, this type of approach can provide health-care services with consistent quality and benefit.¹³ Certain types of health services, such as immunization campaigns and family planning initiatives, may be best delivered using a whole-population approach. The main risk with this approach is that if implementation ends up being partial, inequalities may be

Table 2. Health service coverage gap of skilled birth attendance and one or more antenatal care visits – national average versus within-country inequality in 28 sub-Saharan African countries, 2000–2008

Country	Skilled birth attendance				One or more antenatal care visits			
	Coverage gap (%)		PAR ^a (percentage points)	PAR% ^b	Coverage gap (%)		PAR ^a (percentage points)	PAR% ^b
	National	In richest quintile			National	In richest quintile		
Benin	22	2	20	90	12	1	11	92
Burkina Faso	62	16	47	75	27	4	23	85
Cameroon	38	5	33	86	17	3	14	82
Chad	84	49	35	42	58	23	35	60
Congo	16	2	14	88	13	2	11	85
Democratic Republic of the Congo	25	2	23	93	14	4	10	72
Ethiopia	94	73	21	22	72	42	30	42
Gabon	13	3	10	80	4	2	2	55
Ghana	41	5	36	87	4	0	4	100
Guinea	62	12	50	80	19	2	17	89
Kenya	58	25	34	58	12	6	6	49
Lesotho	44	16	28	64	10	4	6	58
Liberia	53	18	35	67	20	4	16	80
Madagascar	54	8	46	85	20	3	17	85
Malawi	43	15	27	64	7	3	4	56
Mali	73	24	49	67	63	20	43	68
Mozambique	52	11	41	79	15	1	14	94
Namibia	18	2	16	88	5	3	2	40
Niger	82	41	42	51	54	17	37	68
Nigeria	61	14	47	77	45	6	39	87
Rwanda	71	40	31	43	6	5	1	12
Senegal	48	10	37	78	12	2	10	84
Sierra Leone	58	29	29	50	13	3	10	77
Swaziland	26	8	18	70	3	1	2	65
United Republic of Tanzania	54	13	41	76	6	3	3	47
Uganda	57	23	35	60	6	3	3	49
Zambia	53	8	45	84	6	1	5	84
Zimbabwe	31	5	27	85	6	3	3	47
Median	53	13	34	76	13	3	10	70
95% CI of the median	42–58	8–17	28–40	65–83	6–18	2–4	5–16	57–84

CI, confidence interval; PAR, population attributable risk.

^a Absolute inequality.

^b Relative inequality, calculated by dividing population attributable risk by the national health service coverage gap.

Note: Figures may be affected by rounding.

exacerbated; that is, the rich may benefit early in the programme and, if the programme is interrupted (e.g. for lack of funds), the poor are yet to be reached.²⁹

In some situations, a combination of targeted and whole-population approaches may help to decrease the health service coverage gap. Mali, for example, may benefit from a targeted approach for skilled birth attendance and one or more antenatal care visits, and from a whole-population approach to reduce the coverage gap in measles immunization. In Nigeria, action to increase coverage of DPT3 may benefit from a

strong targeted approach, whereas in the United Republic of Tanzania, a whole-population approach may be more appropriate. **Box 1** provides examples of countries adopting different approaches.

Limitations and extension

The overall coverage gap was used to obtain a summary measure of coverage gap for a set of maternal and child interventions with different delivery strategies, based on a set of robust indicators. Although there may be correlations between the variables that are used in the index, this does not obviate

the need for a cross-cutting coverage measure. By using four intervention areas with different delivery strategies, we obtained a broad index of service delivery. For example, although there was a moderate correlation between the treatment of acute respiratory infection in children under 5 years of age and measles vaccination coverage (ρ : 0.48), no correlation was seen between the former indicator and DPT3 vaccination coverage (ρ : -0.04).

The population attributable risk calculation of wealth-related inequality assumed that the wealthiest quintile (the

Table 3. Health service coverage gap for measles immunization, DPT3 immunization, treatment of acute respiratory infection in children under 5 years of age and family planning services, national average versus within-country inequality in 28 sub-Saharan African countries, 2000–2008

Country	Measles immunization				DPT3 immunization				Treatment of acute respiratory infection in children under 5 years of age				Family planning services			
	Coverage gap (%)		PAR ^a (per-centage points)		Coverage gap (%)		PAR ^a (per-centage points)		Coverage gap (%)		PAR ^a (per-centage points)		Coverage gap (%)		PAR ^a (per-centage points)	
	National	In richest quintile	National	In richest quintile	National	In richest quintile	National	In richest quintile	National	In richest quintile	National	In richest quintile	National	In richest quintile	National	In richest quintile
Benin	38	23	15	40	33	13	20	60	64	52	13	20	64	44	20	31
Burkina Faso	43	29	15	34	43	28	15	35	64	27	37	58	68	41	27	40
Cameroon	34	16	18	53	34	21	13	38	59	48	12	20	44	26	18	40
Chad	77	61	16	21	80	58	22	27	80	61	19	24	88	70	18	20
Congo	33	15	18	55	31	9	22	70	53	43	10	19	27	20	7	27
Democratic Rep. of the Congo	36	14	22	62	54	26	28	51	58	46	12	21	54	38	16	30
Ethiopia	63	46	17	27	68	51	16	24	81	67	14	18	69	39	30	44
Gabon	44	27	18	40	64	50	14	22	39	32	7	17	46	35	11	25
Ghana	10	5	5	46	11	7	4	40	51	24	27	54	60	44	17	28
Guinea	48	39	9	19	48	37	12	24	57	39	18	31	70	57	13	18
Kenya	27	12	15	56	27	27	1	3	51	36	15	29	37	24	13	35
Lesotho	15	15	0	0	17	10	7	41	40	27	13	33	45	26	19	42
Liberia	36	13	24	65	49	26	23	47	40	12	28	69	76	61	15	20
Madagascar	41	16	25	61	38	9	29	76	52	34	18	35	47	25	22	47
Malawi	21	12	9	43	18	10	8	45	63	54	9	14	45	34	11	24
Mali	30	20	10	33	31	21	10	32	62	40	22	36	79	64	15	19
Mozambique	23	4	20	84	28	3	25	88	45	38	7	16	42	31	11	26
Namibia	15	5	11	70	16	6	10	64	33	17	16	50	27	13	14	51
Niger	52	26	26	51	60	37	23	38	53	34	19	36	58	50	9	15
Nigeria	58	25	33	58	64	24	40	63	50	31	19	38	58	34	24	41
Rwanda	14	12	2	16	12	12	0	0	72	56	16	22	69	52	17	25
Senegal	26	19	7	28	21	16	6	28	53	39	14	26	73	54	19	26
Sierra Leone	39	32	8	20	39	27	11	29	49	45	4	8	77	57	20	26
Swaziland	8	7	1	14	8	11	0	0	43	41	2	4	32	22	10	33
United Rep. of Tanzania	20	9	11	54	64	62	2	3	40	33	7	19	44	25	19	44
Uganda	32	27	5	16	83	81	3	3	26	19	8	29	63	36	28	44
Zambia	15	6	10	63	79	69	10	13	35	39	0	0	39	26	13	34
Zimbabwe	34	26	8	24	38	31	7	18	74	52	22	30	17	10	8	45
Median	33	16	13	42	38	25	11	33	52	39	14	25	56	35	16	30
95% CI of the median	24–39	12–25	9–18	27–55	29–52	12–30	7–19	24–44	46–59	33–45	10–18	19–33	44–67	26–44	13–19	26–40

CI, confidence interval; DPT3, three doses of vaccine against diphtheria, pertussis and tetanus; PAR, population attributable risk; Rep., Republic.

^a Absolute inequality.

^b Relative inequality, calculated by dividing population attributable risk by the national health service coverage gap.

Note: Figures may be affected by rounding.

Box 1. Country examples of interventions to reduce the health service coverage gap

A. In Kenya, the Kisumu Medical and Educational Trust programme (KMET), based in the city of Kisumu, aims to increase access to reproductive health services by the poor.³⁰ KMET is strengthening the capacity of health-care providers and facilities in poor, rural areas by providing training sessions, basic equipment and small loans. Taking a targeted approach, the programme has been successful in reaching the poorest populations by enrolling mid-level health-care providers (e.g. nurses and clinical officers) in rural areas.

B. In Ghana, the distribution of insecticide-treated bednets (ITNs) was paired with whole-population measles immunization campaigns.³¹ Before the campaign, ITN ownership in the Lawra district of Ghana was less than 10% in all wealth quintiles. After the campaign, the coverage rate of ITN ownership increased to over 90% in all wealth quintiles. This community-level intervention was a cost-efficient method of distributing ITNs to a large population.

C. Brazil is on track to achieving MDG 4 and has made good progress towards MDG 5 thanks to a combination of whole-population and targeted approaches to increasing health coverage.³² A unified health system provides comprehensive health care at the whole-population level. Targeted approaches include the Family Health Strategy, which reorganized primary health care by sending teams of health workers to underserved areas. Since its inception, the programme has been scaled up to reach over 50% of the population, and has contributed to declining infant mortality rates.

D. In Egypt, an immunization campaign contained elements of both whole-population and targeted approaches.²⁵ The campaign achieved widespread geographical coverage, with financial and training support from the central government. Health units used disaggregated data to target resources to populations with lower coverage, and non-physician health workers were empowered to assume greater responsibilities.

reference population) experienced the lowest coverage gap. In a few instances in our study this was not the case; the health-service-specific coverage gap of the wealthiest quintile was reported to be higher than that of at least one of the other quintiles. For example, the coverage gap of specific health interventions in the richest wealth quintile was slightly higher (0.1–3.6%) than the national coverage gap for the treatment of acute respiratory infections in children under 5 years of age (Zambia), DPT3 immunization (Rwanda and Swaziland) and measles immunization (Lesotho). This was not the case with the overall coverage gap. A possible explanation could be that the sample size of the population at risk in the wealthiest quintile (denominator) is too small to generate a meaningful representation of the coverage gap of a specialized service. For instance, the wealthiest quintile of some countries had only a small number of sick children requiring treatment for acute respiratory infection. Alternatively, data may reflect an unknown and consistent pattern of under- or over-reporting during survey interviews. It is also possible that the data reflect the true situation and that the richest quintile did not experience the lowest health service coverage gap.

Reporting bias tends to attenuate the association between wealth quintile and coverage rates. Although over-reporting of child morbidity in the wealthier quintiles is documented,³³ the

extent to which it affects the reporting of health service use is less clear.

We defined inequality based on asset-determined wealth quintiles – a common tool for measuring disparity within populations.³⁴ This frame of reference, however, presents certain limitations.^{13,35,36} The assets chosen to represent wealth must be culturally specific, timely and applicable to all members of a specified population. Wealth quintiles represent only relative wealth differences and may align closely with other forms of disparity (e.g. urban or rural). In certain contexts, other factors (e.g. education, gender or geography) may be more important in determining disparity in health service access.^{19,35}

While breakdown of the coverage gap may be a useful tool to assess the role of within-country inequality, the strength of the measurement relies on the accuracy and availability of data. The lack of high-quality statistical data from developing countries presents challenges for the creation of informed policies,^{17,18,37} a limitation that is exacerbated when attempting inter-country comparisons.²¹ By focusing on within-country comparisons, this data analysis reduced the importance of attaining regionally consistent data. As the quality of data and methods of analysis and monitoring improve, African countries will be better able to use this information to improve health service initiatives.^{6,12} Because coverage gap served as a proxy

for health service provision and use, alternative analyses might segregate these components or expand them to include other types of service indicators.

Our methods may easily be used to break down the health service coverage gap by other forms of inequality, such as education, gender or geography. Population attributable risk takes into account both the situation of all social groups (not only the extremes) and the group population size. Hence, it overcomes the limitations of simple range measures of inequality such as differences or ratios. This study focused on wealth-related inequality in sub-Saharan African countries at a recent time point and did not explore trends in health equity situations; the latter may provide more in-depth evidence for equity-focused interventions. In future studies, our methods could be useful for monitoring inequalities over time and assessing the impact of interventions on reducing inequality.

Conclusion

Overall, a comprehensive monitoring programme may help countries to identify relevant forms of inequality and allow for health service initiatives to be targeted accordingly, where appropriate.^{19,25,38,39} Coverage gap data were presented for select components of the overall coverage gap (one or more antenatal care visits and skilled birth attendance, measles and DPT3 immunization, treatment of acute respiratory infection in children under 5 years of age and family planning); these components correspond to diverse types of child and maternal health indicators. This allowed for within-country comparison, highlighting the variable role of wealth-related inequality within the national coverage gap.

Given the lack of association between the level of national overall coverage gap and the magnitude of relative inequality, policies and programmes that aim to reduce the service coverage gap may not necessarily be effective in tackling within-country inequalities. This finding also reinforces the notion that the determinants of health are not necessarily the same as the determinants of inequalities in health.⁴⁰

Between 1990 and 2006, patterns of inequality in developing countries remained largely unchanged.¹³ This trend has been cited as a major contributor

to the lack of progress on the child and maternal health MDGs.^{1,13,35,37,41} Our study demonstrated the contribution of wealth-related inequality to child and maternal health service coverage gap in

28 sub-Saharan African countries and highlighted the implications for health policy approaches. As the deadline for the MDGs approaches, attention is increasingly turning to child and maternal

health. Now, more than ever, is the time for strong policies and for interventions that will maximize their impact. ■

Competing interests: None declared.

الملخص

نحو تغطية صحية شاملة: تأثير تباين الثروة داخل البلد في 28 بلداً جنوب الصحراء الأفريقية

بحسب كل بلد. وفي ما يتعلق باختبار مؤشرات الخدمات الصحية الفردية، كان تباين الثروة داخل البلد أكثر حدوثاً في خدمات مثل الولادة تحت إشراف قابلات ماهرات والرعاية السابقة للولادة، وكان التباين أقل في تنظيم الأسرة، والتحصين ضد الحصبة، وتلقي الجرعة الثالثة من اللقاح المضاد للخناق والسعال الديكي والكزاز، ومعالجة العدوى التنفسية الحادة في الأطفال أقل من عمر 5 سنوات.

الاستنتاج تختلف مسؤولية تباين الثروة عن فجوة التغطية بخدمات صحة الأطفال والأمهات بحسب كل بلد وبحسب نوع الخدمة الصحية، مما يستدعي تدخلات نوعية للحالات. أما السياسات المستهدفة فستكون أكثر مناسبة عندما يكون هناك تباين عال في الثروة داخل البلد، وعندما تستهدف الأساليب كل السكان، وعندما تكون فجوة تغطية الخدمات الصحية مرتفعة في جميع الشرائح الربعية.

الغرض قياس تأثير تباين الثروة داخل البلد على الفجوة الموجودة في التغطية بالخدمات الصحية المتعلقة بمؤشرات صحة الأمومة والطفولة في جنوب الصحراء الأفريقية، وتحديد مقدار مسؤوليتها في فجوة التغطية بالخدمات الصحية الوطنية.

الطريقة جمعت معطيات تغطية خدمات صحة الطفولة والأمومة في 28 بلداً واقعة جنوب الصحراء الأفريقية من المسح الصحي الديموغرافي للأعوام 2000-2008. وجرى لكل بلد تحديد مؤشر إجمالي التغطية الصحية الوطنية واختيار مؤشرات الخدمة الصحية الفردية. ثم جرى تقسيم المعطيات جميعاً بحسب فجوة التغطية في أغنى شريحة ربعية (أي نسبة الشريحة الربعية التي لا يوجد لديها الخدمة الصحية المطلوبة) والخطر المعزوم بين السكان (وهو قياس مطلق لتباين الثروة داخل البلد).

النتائج في 26 بلداً، تسبب تباين الثروة داخل البلد في حدوث أكثر من ربع إجمالي فجوة التغطية الوطنية. ويمكن خفض هذا التباين في الثروة خفض الفجوة الموجودة بمقدار يصل من 16% إلى 56%،

摘要

实现全民医疗覆盖：撒哈拉以南非洲地区28个国家内部与财富相关的不平等所扮演的角色

目的 旨在衡量撒哈拉以南非洲地区妇幼保健指标的医疗服务覆盖缺口中国家内部与财富相关的不平等现象，并量化该不平等现象对国民医疗服务覆盖缺口的影响。

方法 撒哈拉以南28个非洲国家的妇幼保健服务覆盖情况的数据从2000-2008年间的“人口健康调查”获得。对于每个国家，国民医疗服务覆盖缺口确定为整体医疗服务覆盖指数和选定的个别医疗服务指标。然后分析数据得出最富有的五分位组的覆盖缺口（即缺乏所要求的医疗服务的五分位组的比例）和人口归因危险度（国家内部与财富相关的不平等的绝对度量）。

结果 26个国家中，国家内部与财富相关的不平等占国民整

体覆盖缺口的25%以上。依各国情况而定，减少这种不平等可降低16%-56%的覆盖缺口。就选定的个别医疗服务指标而言，与财富相关的不平等现象在熟练接生和产前护理等服务方面更加普遍，而在计划生育、麻疹疫苗接种、接受三联预防白喉、百日咳和破伤风疫苗和5岁以下儿童急性呼吸道感染治疗方面则不那么普遍。

结论 与财富相关的不平等现象对妇幼保健服务覆盖缺口的作用还受国家和医疗服务类型的影响，因而有必要根据具体情况采取特定干预措施。针对性政策在国家内部与财富相关的不平等水平相对高的国家尤为适用，而全人群方法则对所有五分位组中医疗服务覆盖缺口高的国家都适用。

Résumé

Vers une couverture de santé universelle: le rôle de l'inégalité intra-nationale liée à la richesse, dans 28 pays d'Afrique sub-saharienne

Objectif Mesurer l'inégalité intra-nationale liée à la richesse dans l'écart de couverture sanitaire d'indicateurs de santé maternelle et infantile en Afrique sub-saharienne et quantifier sa contribution à l'écart national de couverture sanitaire.

Méthodes Les données de couverture sanitaire maternelle et infantile dans 28 pays d'Afrique sub-saharienne ont été tirées de l'Enquête démographique et sanitaire de 2000-2008. Pour chaque pays, l'écart national de couverture a été déterminé pour un indice de couverture sanitaire globale et pour des indicateurs sanitaires spécifiques. Les données ont ensuite été ventilées de manière additive dans l'écart de couverture dans le quintile le plus riche (soit la proportion du quintile

sans service sanitaire requis) et le risque imputable à la population (une mesure absolue de l'inégalité intra-nationale liée à la richesse).

Résultats Dans 26 pays, l'inégalité intra-nationale de richesse explique plus d'un quart de l'écart national de couverture globale. Réduire cette inégalité pourrait réduire cet écart de 16% à 56%, selon les pays. Pour les indicateurs sanitaires spécifiques, l'inégalité liée à la richesse était plus fréquente dans des services comme les services d'accouchement et de soins prénatals qualifiés, et moins fréquente pour la planification familiale, la vaccination contre la rougeole, l'administration de la troisième dose de vaccin contre la diphtérie, la coqueluche et le tétanos et le traitement des infections respiratoires aiguës chez les enfants de moins de 5 ans.

Conclusion L'impact de l'inégalité de richesse sur l'écart de couverture sanitaire maternelle et infantile diffère selon les pays et le type de service sanitaire, justifiant des interventions au cas par cas. Des politiques ciblées

sont plus appropriées quand l'inégalité de richesse intra-nationale est élevée, et des approches visant l'ensemble de la population quand l'écart de couverture sanitaire est élevé dans tous les quintiles.

Резюме

На пути к универсальному охвату услугами здравоохранения: роль связанного с материальным благосостоянием внутристранового неравенства в 28 странах Африки к югу от Сахары

Цель Измерить связанное с материальным благосостоянием внутристрановое неравенство в отношении разрыва в охвате медико-санитарными услугами в области охраны здоровья матери и ребенка в странах Африки к югу от Сахары и определить его количественную долю в общестрановом показателе разрыва в охвате медико-санитарными услугами.

Метод Данные об охвате услугами в области охраны здоровья матери и ребенка по 28 странам Африки к югу от Сахары были взяты из материалов Обследования в области народонаселения и здравоохранения за 2000–2008 годы. Для каждой страны общенациональный разрыв в охвате определялся для совокупного индекса охвата медико-санитарными услугами и избранных индикаторов по конкретным медико-санитарным услугам. После этого в данных были дополнительно выделены разрыв в охвате в богатейшем квинтиле (т. е. доля квинтиля, не получающего требуемой медико-санитарной услуги) и добавочный популяционный риск (абсолютная мера связанного с материальным благосостоянием внутристранового неравенства).

Результат В 26 странах на долю связанного с материальным благосостоянием внутристранового неравенства приходилось более ¼ совокупного общенационального разрыва в охвате.

Снижение этого неравенства позволило бы сократить разрыв на 16–56%, в зависимости от страны. Среди избранных показателей по конкретным медико-санитарным услугам неравенство, связанное с материальным благосостоянием, было более широко распространено в таких услугах, как квалифицированные родовспоможение и дородовой уход, и менее широко – в таких как планирование семьи, иммунизация против кори, прием третьей дозы вакцины против коклюша, дифтерии и столбняка, и лечение острых респираторных инфекций у детей в возрасте до 5 лет.

Вывод Вклад неравенства, связанного с материальным благосостоянием, в показатель разрыва в охвате медико-санитарными услугами по охране здоровья матери и ребенка различается в зависимости от страны и вида медико-санитарной услуги, что требует применения конкретных мер вмешательства. Адресные политические меры наиболее применимы в тех случаях, когда имеет место высокий уровень связанного с материальным благосостоянием внутристранового неравенства, а популяционные подходы – когда разрыв в охвате медико-санитарными услугами значителен во всех квинтилях.

Resumen

Hacia la cobertura sanitaria universal: el papel de la desigualdad nacional en cuanto a riqueza en 28 países del África subsahariana

Objetivo Medir la desigualdad en cuanto a la riqueza de cada país con respecto a las carencias en la cobertura del servicio sanitario de los indicadores de salud materno-infantil en el África subsahariana y cuantificar su contribución a las carencias de cobertura en los servicios sanitarios nacionales.

Métodos A través de la Encuesta sobre Salud y Demografía de 2000–2008 se obtuvieron los datos de cobertura de los servicios sanitarios materno-infantiles en 28 países del África subsahariana. Para cada uno de los países se determinaron las carencias de cobertura nacional para un índice de cobertura global de servicios sanitarios y para indicadores de servicios sanitarios individuales. Los datos se separaron además en las carencias de cobertura para el quintil más rico (por ejemplo, la proporción del quintil que carecía del servicio sanitario necesario) y el riesgo atribuible a la población (una medida absoluta de la desigualdad en cuanto a riqueza de cada país).

Resultado En 26 países, la desigualdad nacional en cuanto a la riqueza, constituyó más de un cuarto de las carencias de cobertura total del país.

Si se redujera dicha desigualdad, estas carencias disminuirían entre un 16% y un 56%, dependiendo del país. En cuanto a los indicadores de servicios sanitarios individuales, la desigualdad en cuanto a riqueza fue más palpable en servicios como la asistencia profesional al parto y la asistencia prenatal, y menos destacada en la planificación familiar, la vacunación contra el sarampión, la recepción de una tercera dosis de la vacuna contra la difteria, la tos ferina y el tétano y en el tratamiento de infecciones respiratorias agudas en niños menores de 5 años.

Conclusión La contribución de la desigualdad en cuanto a riqueza en las carencias de cobertura de servicios sanitarios materno-infantiles varía en cada país y según el servicio sanitario, por lo que necesita intervenciones específicas para cada caso. Las normativas específicas son las más adecuadas cuando se producen casos de marcada desigualdad en cuanto a riqueza dentro de un país, y los enfoques globales, para aquellos países con unas carencias de cobertura de servicios elevadas en todos los quintiles de población.

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