

Helpdesk Report: Under Five Mortality Ethiopia

Date: 7th October 2011

Query: How does the rate of reduction of under five mortality from the DHS results in Ethiopia compare with the rates in other countries?
What comparisons can be made to the rate of reduction that was made in the UK?

Enquirer: DFID Ethiopia

Content

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1. Overview

The 2006-2010 percentage decrease in under 5 mortality in Ethiopia is significant and among the greatest declines found in this brief search. However, there is some evidence that the percentage decrease may be less than the DHS reports and also some evidence that there was a greater percentage decrease between 2000 and 2005. There have also been greater percentage decreases in other African countries over a similar period. These include Kenya, Tanzania and Egypt.

The UK decrease in under 5 mortality was 8% between 2005 and 2009 so the percentage decrease was lower. There was a 40% decrease in under 5 mortality between 1990 and 2009. Historically, the UK took longer to make progress in lowering mortality rates in terms of the percentage decrease. It took around 20 years during the 18th and 19th centuries to make the same progress as is possible in 5 years in many developing countries in this century.

This list is not definitive. It is a sample of countries and regions.				
Country	Baseline (per 1000)	Most Recent Data (per 1000)	Percentage Decrease	Source
Ethiopia	121.9 (2005) 123 (2006) 163.2 (2005)	104.4 (2009) 88 (2010) 150.8 (2010) 104 (2009)	14% 28% 8%	World Bank DHS BUCEN (US) UNICEF
Historical Data	---- 174 (2000) 141 (1996-2000) 165 (1991-5)	---- 121.9 (2005) 123 (2001-5) 141 (1996-	---- 30% 13% 15%	UNICEF DHS DHS

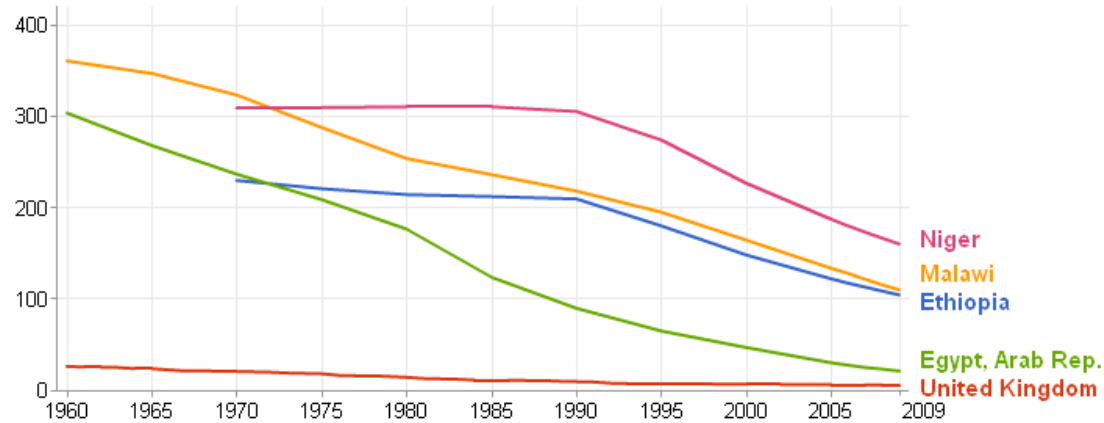
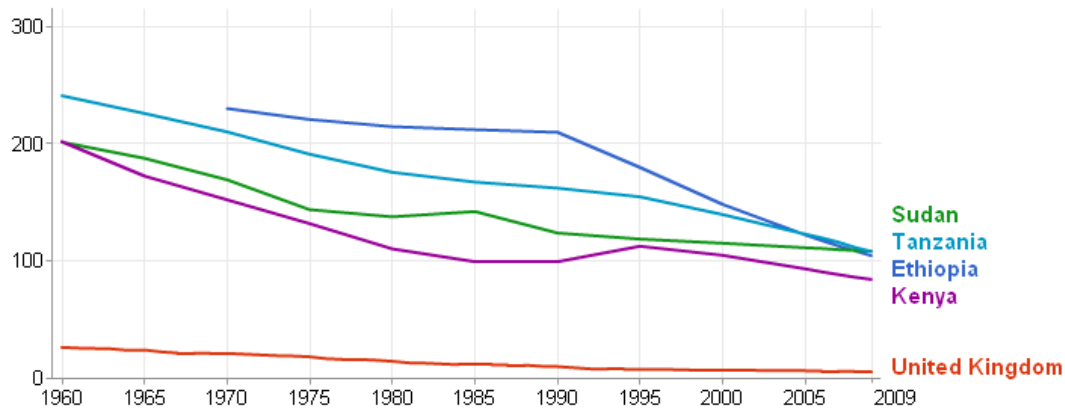
		2000)		
Kenya	114.6 (2003) 92.9 (2005)	73.6 (2008) 84 (2009) 84 (2009)	36% 10%	DHS World Bank UNICEF
Egypt	30 (2005) 41 (2001-5)	21 (2009) 28 (2004-8)	30% 32%	World Bank DHS
Tanzania	122.8 (2005) 112 (2005)	107.9 (2009) 81 (2010)	12% 28%	World Bank DHS
Malawi	133.6 (2005) 133 (2004)	110 (2009) 112 (2010)	17% 16%	World Bank DHS
Niger	187 (2005)	160.3 (2009)	14%	World Bank
Sudan	111.1 (2005)	108.2 (2009)	3%	World Bank
Other Regions				
Thailand	16 (2005)	13.5 (2009)	17%	World Bank
Peru	28.1 (2005)	21.3 (2009)	24%	World Bank
Turkey	27.9 (2005) 56 (1994-98)	20.3 (2009) 37 (1999-2003)	27% 34%	World Bank DHS
China	25.3 (2005)	19.1 (2009)	25%	World Bank
India	76.5 (2005)	65.6 (2009)	14%	World Bank
Bangladesh	66.2 (2005)	52 (2009)	21%	World Bank
Brazil	25.8 (2005)	20.6 (2009)	20%	World Bank
Mexico	20.3 (2005)	16.8 (2009)	17%	World Bank
Indonesia	45.7 (2005)	38.9 (2009)	15%	World Bank
Nepal	62.2 (2005) 70 (2001-5)	48.2 (2009) 54 (2006-10)	23% 23%	World Bank DHS
Current UK Data	6 (2005) 10 (1990)	5.5 (2009) 6 (2009)	8% 40% (19 years)	World Bank UNICEF
Historical UK Data	74.5 (1730–1749) London 74.5 (1730-49) 63% (1750-69) 51.5% (1770-89) 41.3% (1790-09) 82.3 (1779-87)	31.8 (1810-1829) London 63% (1750-69) 51.5% (1770-89) 41.3% (1790-09) 31.8% (1810-29) 45.6 (1818-24)-likely underestimated 66 in 1830 is more likely	57% (80 years) 15% (20 years) 18% (20 years) 20% (20 years) 23% (20 years) 45% (40 years) 20% (45 years)	Health, Wealth and Population in the Early Days of the Industrial Revolution, Mabel C. Buer, London: George Routledge & Sons, 1926 Carlisle Tables (Source: Buer, 1926, as above)
Infant Mortality Rates to compare progress	130 (1881) 109 (1909)	138 (1885) 108 (1913)	6% increase 1% decrease <i>Infant mortality continuously decreased from the mid 1940s onwards (see graph in section 6)</i>	The Causes of Rapid Infant Mortality Decline in England and Wales, 1861–1921 Part I, R.I. Woods, PA. Watterson & JH. Woodward, Population Studies, 2010
Infant mortality and childhood mortality have fallen most dramatically during the last 100 years. Childhood mortality rates were nearly 50 times				

	higher in males and 65 times higher in females at the beginning of the 20th century.
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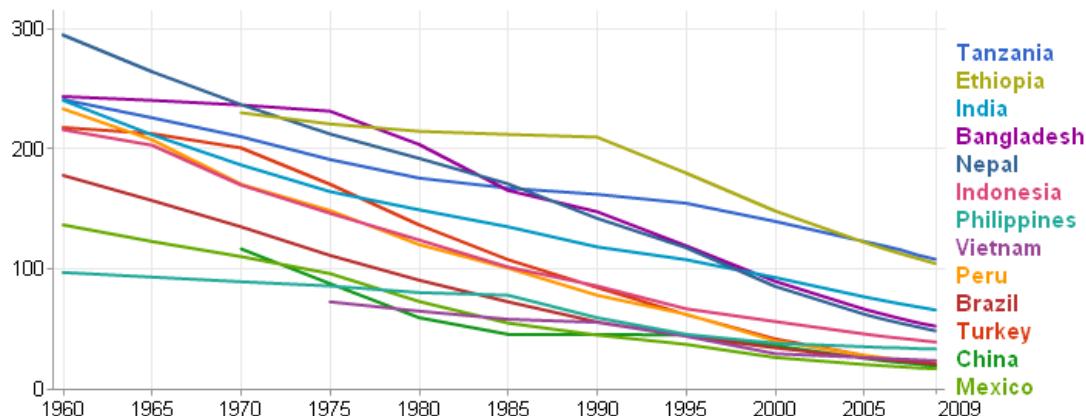
<p>Notes</p> <p>Percentage decrease in under 5 mortality $[(\text{Number at later time} \div \text{Number at earlier time}) - 1] \times 100$ <p>* Percentages highlighted in blue indicate percentage decreases 28% and over</p> </p>
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Under 5 Mortality Rate (these graphs can be produced for any country combinations)-

http://www.google.co.uk/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&nselem=h&met_y=sh_dyn_mort&hl=en&dl=en#ctype=l&strail=false&nselem=h&met_y=sh_dyn_mort&scale_y=lin&ind_y=false&rdim=country&idim=country:ETH:GBR:SDN:KEN:TZA&ifdim=country&hl=en&dl=en



http://www.google.co.uk/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&nselem=h&met_y=sh_dyn_mort&hl=en&dl=en#ctype=l&strail=false&nselem=h&met_y=sh_dyn_mort&scale_y=lin&ind_y=false&rdim=country&idim=country:ETH:MWI:NER:EGY:GBR&ifdim=country&hl=en&dl=en



http://www.google.co.uk/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&nsem=h&met_y=sh_dyn_mort&hl=en&dl=en#ctype=l&strail=false&nsem=h&met_y=sh_dyn_mort&scale_y=lin&ind_y=false&rdim=country&idim=country:TZA:TUR:PER:CHN:BGD:IND:IDN:MEX:BRA:NPL:VNM:PHL:ETH&ifdim=country&hl=en&dl=en

2. Under 5 Mortality in Ethiopia

DHS survey

For the five years immediately preceding the survey (corresponding roughly to 2006–2010); the overall under-5 mortality rate is 88 deaths per 1,000 live births. Sixty-seven percent of all deaths to children under-five in Ethiopia take place before a child's first birthday. The 2011 EDHS shows a rapid decrease in infant and under-five mortality during the five years prior to the survey compared to the period 5-9 years prior. The levels are also considerably lower than those reported in the 2005 EDHS. For example, infant mortality has decreased by 23 percent, from 77 to 59 deaths per 1,000 births, while under-five mortality has decreased by 28 percent, from 123 to 88 per 1,000 births.

Table 7. Early childhood mortality rates

Neonatal, post-neonatal, infant, child, and under-five mortality rates for five-year periods preceding the survey, Ethiopia 2011

Years preceding the survey	Neonatal mortality (NN)	Post-neonatal mortality (PNN) ¹	Infant mortality (1q0)	Child mortality (4q1)	Under-five mortality (5q0)
0-4	37	22	59	31	88
5-9	48	40	88	49	133
10-14	54	47	101	72	166

¹ Computed as the difference between the infant and neonatal mortality rates

Ethiopia 2010 MDGs Report, MoFED

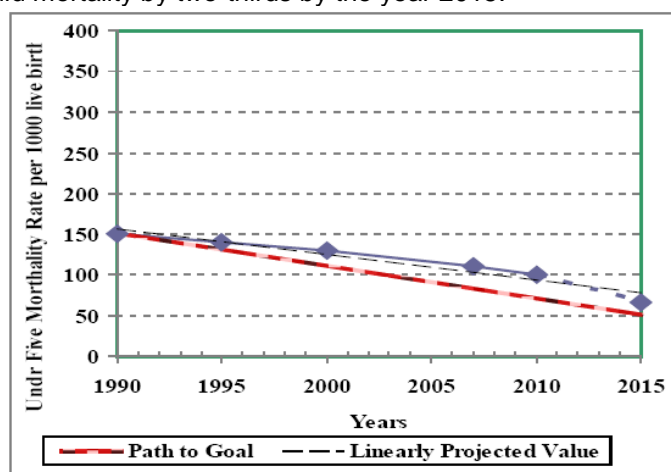
http://www.undp.org/africa/documents/mdg/ethiopia_september2010.pdf

The under-five mortality rate has decreased to 123/1,000 in 2005/06 from 167/1,000 in 2001/02 and the infant mortality rate has declined to 77 per 1,000 live births in 2004/05 from 97 per 1,000 live births in 2001/02. In 2009/10 the under five mortality rates and infant mortality rates decreased to 101/1000 and to 45/1000 live births, respectively. Malaria (20%),

Pneumonia (28%), Diarrheal Diseases (20%) and Newborn conditions (25%) each account for the major causes of child deaths in Ethiopia.

The improvement of children's health is an essential component of the Health Sector Development Programme (HSDP) III that focuses on poverty related health conditions. HSDP III which ends in the middle of 2010, envisaged a reduction of the mortality rates of children under-five from 123/1,000 to 85/1,000 and the infant mortality rate from 77 to 45 per 1000 live births by 2015. This prognosis is based on an increased coverage of maternal, newborn and child health, nutrition and WASH related interventions.

Although the full immunization performance has increased significantly from 22.3% in 1999/2000 to 65.5% in 2008/09, it requires further effort. As indicated below, Ethiopia is on track to reduce child mortality by two-thirds by the year 2015.



Source: MoFED and MoH

Ethiopia- USAID Report

http://pdf.usaid.gov/pdf_docs/PNADU689.pdf

Under-5 Mortality Rate (BUCEN)	150.8	per 1,000 live births	2010	BUCEN-IDB-2006
Neonatal Mortality Rate	39	per 1000	2005	DHS STATcompiler as of September 2008-2008
Under-5 Mortality Rate (UNICEF)	109	per 1,000 live births	2008	UNICEF-2010
Under-5 Mortality Rate (DHS)	123	per 1,000 live births	2005	Ethiopia DHS-2005

Table 3: Infant Mortality Rates / Under-5 Mortality Rates

Source: BUCEN-IDB 2010

Indicator	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Infant Mortality Rate (BUCEN)	147.1	157.8	133.1	128.4	98.7	88.5	79.0	70.0	61.7	53.9	46.8	40.4	34.8	29.8	25.4
Under-5 Mortality Rate (BUCEN)		231.0	197.8	187.6	174.5	163.2	150.8	135.2	119.3	103.4	87.9	73.1	59.5	47.6	37.5

3. Data From Other Countries

Guardian Development Report

<http://www.guardian.co.uk/global-development/mdg/interactive#/>

There has been significant and steady progress in child health across the world but this was one of the most demanding of the goals and the world will fall short: by 2007 child mortality

had dropped by only a third. But this overall finding masks some dramatic improvement in different parts of the globe.

China halved child mortality from 46 per 1000 in 1990 to 21 in 2008 while India's rate fell from 116 to 69 and Vietnam has achieved a remarkably low rate of 14 per 1000 for a low income country. The African child mortality average is almost twice as high as the global, and in five countries in Sub-Saharan Africa, under five mortality has actually increased since 1990. Kenya actually regressed, it increased from 105 to 128 per 1000 births despite its comparative economic strength.

UK World Bank Data

http://www.google.co.uk/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&nseim=h&met_y=sh_dyn_mort&hl=en&dl=en#ctype=l&strail=false&nseim=h&met_y=sh_dyn_mort&scale_y=lin&ind_y=false&rdim=country&idim=country:ETH:GBR:SDN:KEN:TZA&ifdim=country&hl=en&dl=en

6.5- 2002

6- 2005

5.9- 2006

5.8-2007

5.6-2008

5.5- 2009

8.3% decrease over 4 years.

Kenyan DHS Data

<http://www.measuredhs.com/publications/publication-SPA17-SPA-Final-Reports.cfm>

Indicator	1989	1993	1998	2003	2008-09
Under-five mortality rate (per 1,000 live births)	89.8	96.1	111.5	114.6	73.6

This is a 36% decrease in the 5 years between 2003 and 2008/9.

The under-five mortality rate was estimated at 74 deaths per 1,000 live births, meaning that 1 in every 14 Kenyan babies does not survive to the fifth birthday. Neonatal mortality now accounts for approximately 60 percent of under-five mortality in Kenya (KNBS and ICF Macro, 2010).

Malawi DHS Data

2005-2010- 23% reduction using DHS figures

Years preceding the survey	Approximate time period of estimated rates	Neonatal mortality (NN)	Post-neonatal mortality ¹ (PNN)	Infant mortality (₁ q ₀)	Child mortality (₄ q ₁)	Under-5 mortality (₅ q ₀)
0-4	2005-2010	31	35	66	50	112
5-9	2000-2005	36	46	81	69	145
10-14	1995-2000	40	52	92	97	180

Note: Estimates are for deaths per 1,000 live births except for child mortality, which is deaths per 1,000 children age 12-59 months.
¹ Computed as the difference between the infant and neonatal mortality rates

Table 8.2 Trends in early childhood mortality
 Neonatal, post-neonatal, infant, child, and under-5 mortality rates for five-year periods preceding the survey, Malawi 1992-2010

Survey	Neonatal mortality (NN)	Post-neonatal mortality ¹ (PNN)	Infant mortality (${}_1q_0$)	Child mortality (${}_4q_1$)	Under-5 mortality (${}_5q_0$)
MDHS 2010	31	35	66	50	112
MDHS 2004	27	49	76	62	133
MDHS 2000	42	62	104	95	189
MDHS 1992	41	94	134	115	234

Note: Estimates are for deaths per 1,000 live births except for child mortality, which is deaths per 1,000 children age 12-59 months.
¹ Computed as the difference between the infant and neonatal mortality rates

<http://www.measuredhs.com/pubs/pdf/FR247/FR247.pdf>

4. Worldwide Trends

Comparative DHS Reports

<http://www.measuredhs.com/publications/publication-CR4-Comparative-Reports.cfm>

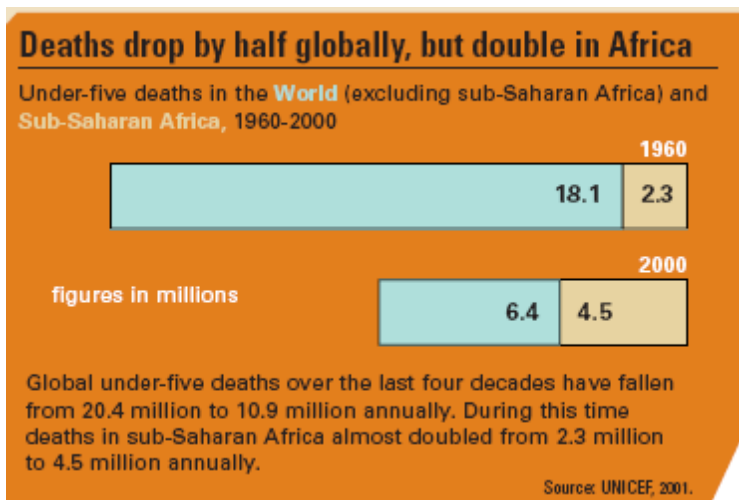
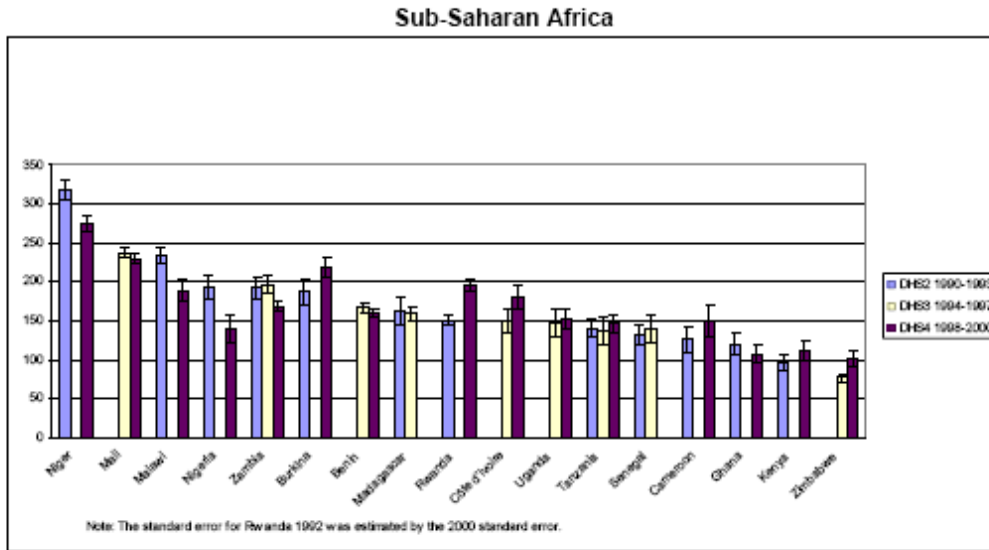
<http://www.measuredhs.com/pubs/pdf/CR4/CR4.pdf>

Statistically significant declines in under-five mortality have occurred in Malawi, Niger, Nigeria, Egypt, Bangladesh, India, Indonesia, Nepal, Brazil, and Peru. The largest declines were in the three African countries where there was the most room for improvement

In much of sub-Saharan Africa, improvements in child survival over the past few years are being reversed. There are significant increases in under-five mortality in four of the sub-Saharan countries for which comparative data are available. An additional five countries appear to have non-significant increases. Rwanda and Zimbabwe are the most notable examples, with under-five mortality estimates increasing from 151 to 196 in Rwanda and 77 to 102 in Zimbabwe.

Of the 60 countries that account for 94 percent of child deaths, only Bangladesh, Brazil, Egypt, Indonesia, Mexico, Nepal and the Philippines are currently on-track to achieve their MDG 4 targets.

Figure 8 Trends in under-five mortality (five-year rates) for countries with more than one DHS survey, and sampling errors (95 percent confidence intervals)



Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis

Rafael Lozano, Haidong Wang, Kyle J Foreman, Julie Knoll Rajaratnam, Mohsen Naghavi, Jake R Marcus, Laura Dwyer-Lindgren, Katherine T Lofgren, David Phillips, Charles Atkinson, Alan D Lopez, Christopher J L Murray, *Lancet* 2011; 378: 1139–65
<http://download.thelancet.com/pdfs/journals/lancet/PIIS0140673611613378.pdf?id=e16241398b8eb460:-52016045:13320266f47:319f1319099106451>

Overall, 31 countries will achieve the original (MDG 4) target by 2015 with a further 11 countries achieving the target by 2020. In sub-Saharan Africa, Madagascar is likely to achieve MDG 4 by 2015, whereas eight countries (Eritrea, Ethiopia, Ghana, Liberia, Malawi, Rwanda, São Tomé and Príncipe, and Sierra Leone) are likely to achieve it by 2025. 23 countries in sub-Saharan Africa are unlikely at the present pace to achieve MDG 4 before 2040.

The report also explains how this was calculated, it is based on the annual rate of change from 1990 to 2011 for 137 developing countries.

5. Information about the DHS

Monitoring trends in under-5 mortality rates through national birth history surveys

EL Korenromp, F Arnold, BG Williams, BL Nahlen and RW Snow

International Journal of Epidemiology, Volume33, Issue6, 2004, Pp. 1293-1301

The interpretation of changes in under-5 mortality rates between surveys needs to take into account statistical significance. DHS birth history surveys with their present sampling design would be able to statistically confirm under-5 mortality reductions in African countries if true reductions were 15% or larger, and are highly relevant to tracking progress towards existing international child health targets.

Key Messages

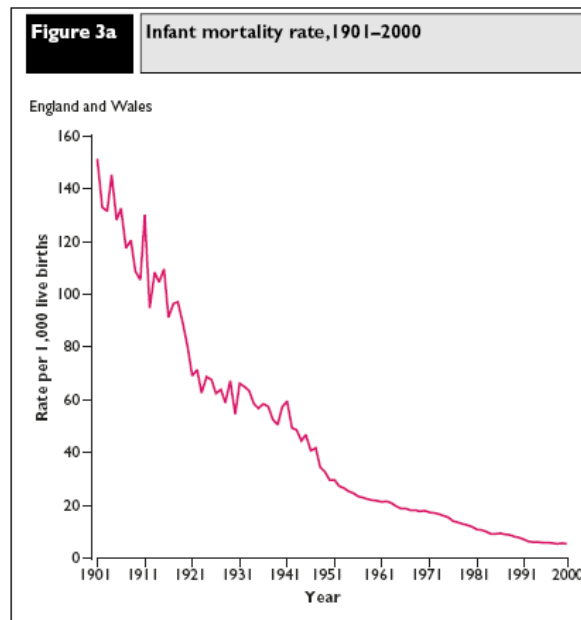
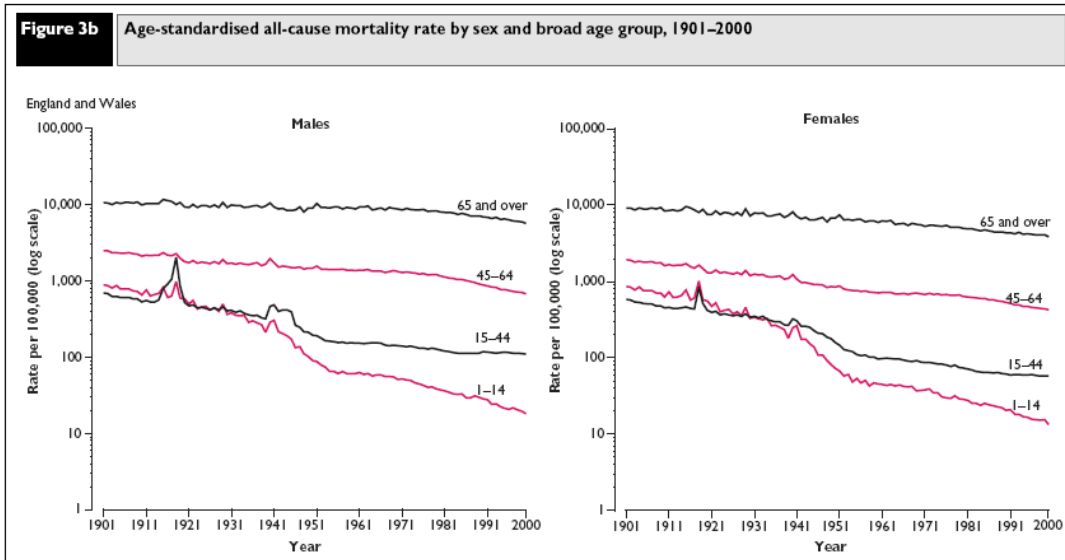
- Demographic and Health Surveys (DHS), conducted at 5-year intervals in an increasing number of countries, are a main source of high quality estimates of under-5 mortality rates in African countries.
- In interpreting under-5 mortality rates and trends in mortality rates from DHS, statistical precision and significance must be taken into account. Across actual surveys conducted between 1986 and 2002, only half of the trends observed in mortality rates at national levels were statistically significant.
- With levels of precision observed in previous African DHS, reductions in all-cause under-5 mortality rates between successive surveys of 15% or more are detectable. This is highly relevant to tracking progress towards international child health targets; the detection of smaller mortality reductions would, however, require increases in sample size, from a current median of 7060 to over 20 000 women.

6. UK Mortality

Twentieth Century Mortality Trends in England and Wales

<http://www.ons.gov.uk/ons/search/index.html?pageSize=50&newquery=under+5+mortality+1900>

Infant mortality and childhood mortality have fallen most dramatically during the last 100 years. Infant mortality rates at the beginning of the century were nearly 30 times higher than those at the end. Childhood mortality rates were nearly 50 times higher in males and 65 times higher in females.



http://www.scran.ac.uk/scotland/pdf/SP2_3Health.pdf

The infant mortality rate for England and Wales in the early 1850s was 150 deaths per 1000 live births; in Scotland it was 120 per 1000. In the 1890s there was a deterioration in the Scottish figures as infant mortality rose to 129 per 1000 live births. By 1913 the Scottish rate was only slightly better than the English. But if we look at the poorest areas of, say, Glasgow then the Scottish figures are as bad as anywhere else. As late as 1898 the infant mortality rate in Glasgow Gorbals was 200 per 1000 live births. The reason for this was the increased concentration of the population in urban areas and their poverty. Scotland really only fared better than England in the first half of the 19th century because a higher number of its people were living in the countryside.

Health, Wealth and Population in the Early Days of the Industrial Revolution,
Mabel C. Buer, London: George Routledge & Sons, 1926, page 30 ISBN 0-415-38218-1

http://books.google.com/books?id=F0RhcY8uCXwC&printsec=frontcover&dq=Health,+Wealth+and+Population+in+the+Early+Days+of+the+Industrial+Revolution&source=bl&ots=0JL3M9_x-&sig=j64nnl-lkYHJINv4FeAEKU3rsU4&hl=en&ei=Cd5NTNWXXoH_8AaC6fT5Cw&sa=X&oi=book_result&ct=result&resnum=3&ved=0CBgQ6AEwAg#v=onepage&q&f=false

During the Industrial Revolution, the life expectancy of children increased dramatically. The percentage of the children born in London who died before the age of five decreased from 74.5 per thousand in 1730–1749 to 31.8 per thousand in 1810–1829.

Date	Under 5 Mortality Rate
1730-49	74.5%
1750-69	63%
1770-89	51.5%
1790-1809	41.3%
1810-29	31.8%

Carlisle Tables

1779-87- 82.3 per 1000

1818-24- 45.6 per 1000

Recent UK under five mortality data can be found from:

The World Bank World Development Indicators:

http://www.google.co.uk/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&nseml=h&met_y=sh_dyn_mort&hl=en&dl=en#ctype=l&strail=false&nseml=h&met_y=sh_dyn_mort&cale_y=lin&ind_y=false&rdim=country&idim=country:IND:IDN:ETH:THA&ifdim=country&hl=en&dl=en

UNICEF: http://www.unicef.org/infobycountry/uk_statistics.html

Office for National Statistics: <http://www.ons.gov.uk/ons/index.html>

7. Additional information

Author

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