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*CIHI Country Health Profile Series*

# SUDAN

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## Health Statistics Report 1996



Center for International Health Information  
1601 N. Kent Street, Suite 1014  
Arlington, VA 22209

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**The Center for International Health Information**

**1601 N. Kent Street, Suite 1014**

**Arlington, VA 22209**

**(703) 524 - 5225**

**FAX (703) 243 - 4669**

**E-Mail address: [info@cihi.com](mailto:info@cihi.com)**

**Internet address: [www.cihi.com](http://www.cihi.com)**

# SUDAN

## Health Statistics Report

**T**his is part of a series of Country Health Profiles produced by the Center for International Health Information (CIHI). Each profile provides quantitative data on current health and demographic conditions in a developing country. Profile information is compiled from CIHI's databases and reference library and through research and analysis of other data sources.

CIHI's Health Statistics Reports are intended to provide data in a concise format for individuals and organizations involved in health sector policy and decision-making. Contact CIHI at the address on the preceding page for information on the availability of country health profiles and health statistics reports, or look for these reports on the Internet at the following address: *www.cihi.com*.

In order to enable CIHI to report the most current health and demographic data, readers are encouraged to provide any more recent or more accurate information by contacting the center directly or through USAID's Office of Health and Nutrition.

## EDITOR'S NOTES

**1. Data Notes.** For definitions of indicators and commentary regarding their derivation, the reader is referred to Section II.

**2. References & Sources.** Sources in this profile are referred to by a seven-digit code. Generally, the first three letters refer to a source institution, the following two numbers refer to the year of publication or transmittal, and the final two numbers uniquely identify the individual source. A complete list of sources appears in Section III.

**3. Comparative Graphs and Tables.** Unless otherwise specified, indicator values for country groupings are median values for the countries in each aggregate grouping for which data are available. Regional groupings include: (1) Sub-Saharan Africa, which includes the 47 countries comprising USAID's Africa Region; (2) No. Africa & Mideast, which corresponds to USAID's Near East Sub-region and includes 21 countries from Morocco in the West to Afghanistan in the East; (3) Asia, which corresponds to USAID's Asia Sub-region and includes 24 developing countries from Pakistan eastward; (4) Latin Am. & Carib. which includes 46 countries of Central and South America and the Caribbean and corresponds to USAID's Latin America and Caribbean region. Income groupings are based on the classifications used by the United Nations' Human Development Report 1995, which are defined as: (1) Low -Income Countries (GNP per capita = \$696 or less), (2) Middle-Income Countries (GNP/capita \$696-\$8,625); (3) High-Income Countries (GNP/capita > \$8,625). "Developing Countries" indicators are based on 107 countries which are not regarded as "Established Market Economies" by the World Bank's World Development Report 1994.

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# I: HEALTH & DEMOGRAPHIC OVERVIEW

## Current Demographic and Health Indicators

Demographic Indicators			
INDICATOR	VALUE	YEAR	SOURCE
Total population (000s)	30,120	1995	BUC9401
Urban percent	25	1995	UNP9400
Women ages 15-49 (000s)	6,425	1995	CAL9602
Infant mortality rate	79	1995	BUC9302
Under 5 mortality rate	132	1995	JEE9504
Maternal mortality rate	537	1989	DHS9107
Life expectancy at birth	54	1995	UNP9400
Number of births (000s)	1,177	1995	CAL9603
Annual infant deaths (000s)	93	1995	CAL9604
Total fertility rate	6.1	1995	PRB9601

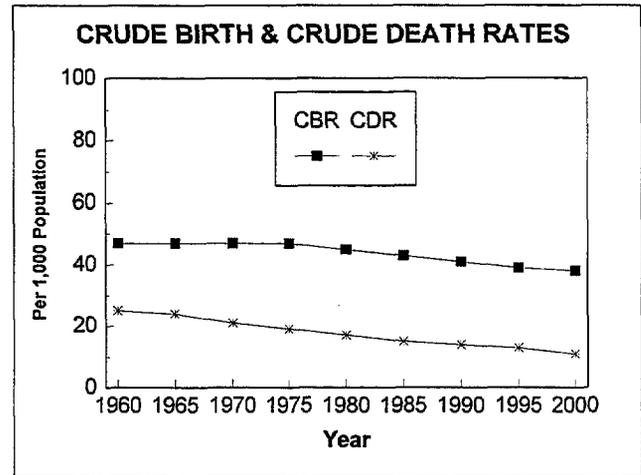
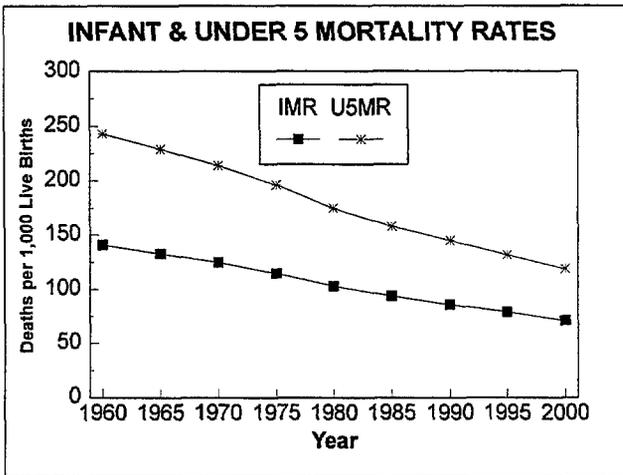
Child Survival Indicators			
INDICATOR	VALUE	YEAR	SOURCE
<b>Vaccination Coverage (%)</b>			
BCG	88	1995	WHE9601
DPT3	76	1995	WHE9601
Measles	74	1995	WHE9601
Polio 3	76	1995	WHE9601
TT2+	65	1995	WHE9601
DPT drop out rate	22	1990	DHS9107
<b>Oral Rehydration Therapy (%)</b>			
ORS access rate	50	1993	WHD9401
ORT use rate	47	1993	WHD9401
<b>Contraceptive Prevalence (%)</b>			
CPR, modern methods	6	1990	DHS9107
CPR, all methods	9	1990	DHS9107
<b>Nutrition (%)</b>			
Adequate nutritional status	NA		
Exclusive breastfeeding	14	1990	DHS9107
Complementary feeding	45	1990	DHS9107
Continued breastfeeding	80	1990	DHS9107

Other Health Indicators			
INDICATOR	VALUE	YEAR	SOURCE
<b>HIV Prevalence</b>			
Adults (per 100,000)	992	1994	WHO9601
<b>Access to Improved Water (%)</b>			
Urban	55	1991	JMP9301
Rural	43	1991	JMP9301
<b>Access to Sanitation (%)</b>			
Urban	89	1991	JMP9301
Rural	65	1991	JMP9301
<b>Delivery Conditions</b>			
Deliveries by trained attendants (%)	69	1990	DHS9107

NA=Notavailable

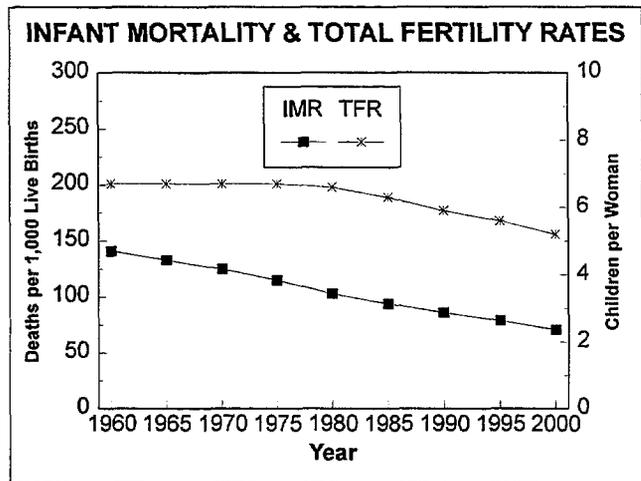
## Trends in Selected Demographic and Health Indicators

INDICATOR	1960	1965	1970	1975	1980	1985	1990	1995	2000	SOURCE
Infant Mortality Rate	142	131	118	105	91	74	63	52	43	JEE9512
Under 5 Mortality Rate	207	190	170	151	130	104	88	72	59	JEE9507
Crude Birth Rate	47	45	42	39	36	32	28	27	25	UNP9400
Crude Death Rate	19	17	14	12	11	9	8	7	6	UNP9400
Avg Annual Growth	2.8	2.8	2.8	2.7	2.5	2.2	2.0	1.9	1.8	UNP9400
Total Fertility Rate	6.9	6.7	6.3	5.7	5.0	4.2	3.6	3.3	3.0	UNP9400



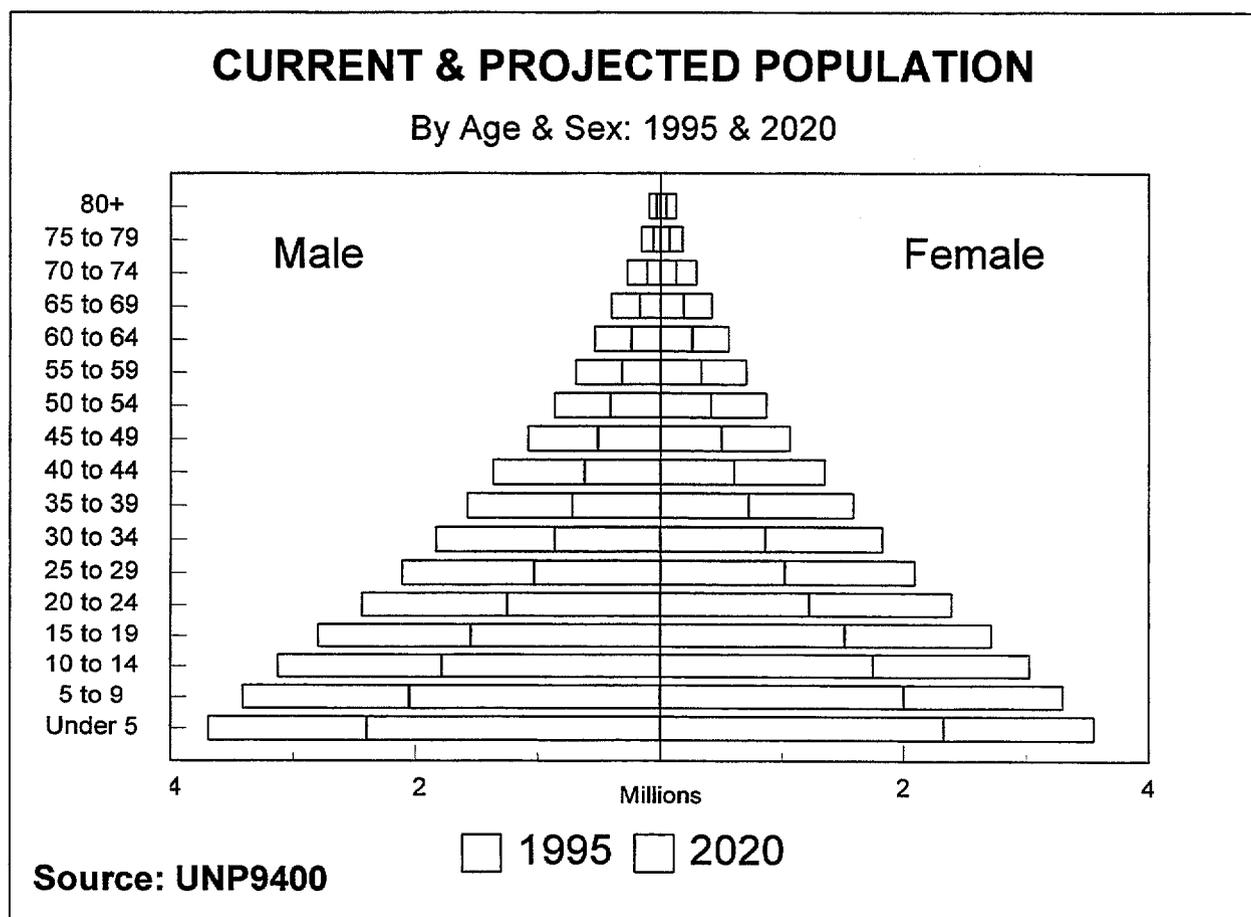
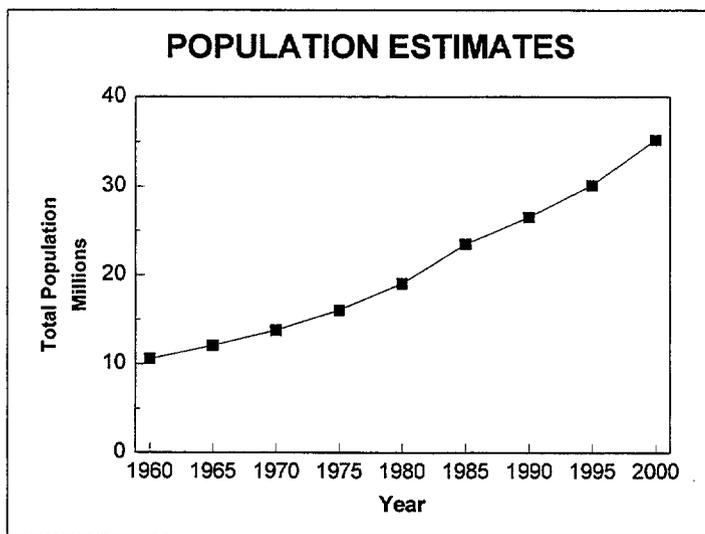
### IMR and TFR

The relationship between IMR and TFR is currently a subject under review by the scientific community. While there is not conclusive evidence that the IMR and TFR are causally linked and necessarily decline together, there is empirical evidence for suspecting that such a reinforcing relationship exists as the pattern is observable in most countries.



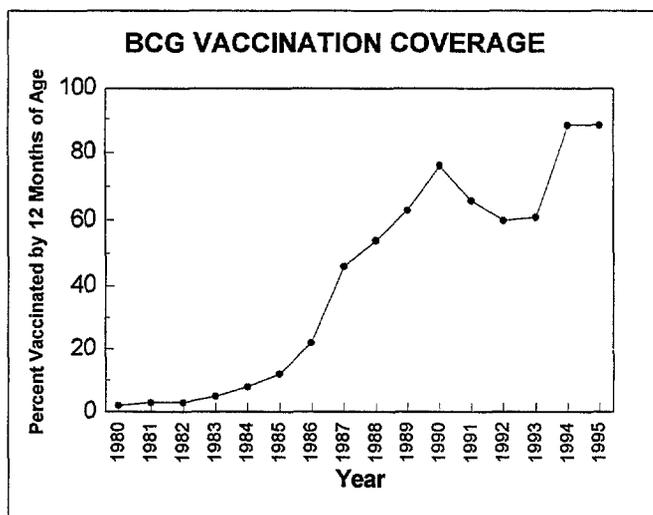
## Population Estimates/Pyramid

POPULATION ESTIMATES		
YEAR	VALUE	SOURCE
1960	10,588,990	BUC9401
1965	12,085,790	BUC9401
1970	13,787,600	BUC9401
1975	16,056,000	BUC9401
1980	19,064,000	BUC9401
1985	23,498,500	BUC9401
1990	26,542,400	BUC9401
1995	30,120,400	BUC9401
2000	35,235,800	BUC9401

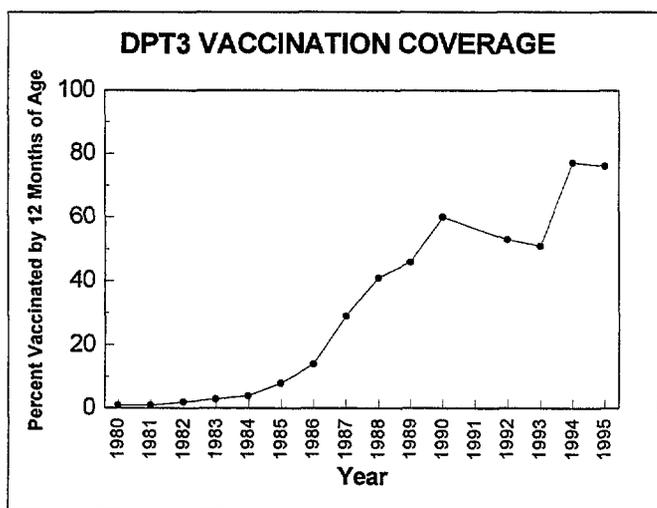


## Trends in Selected Health and Child Survival Indicators

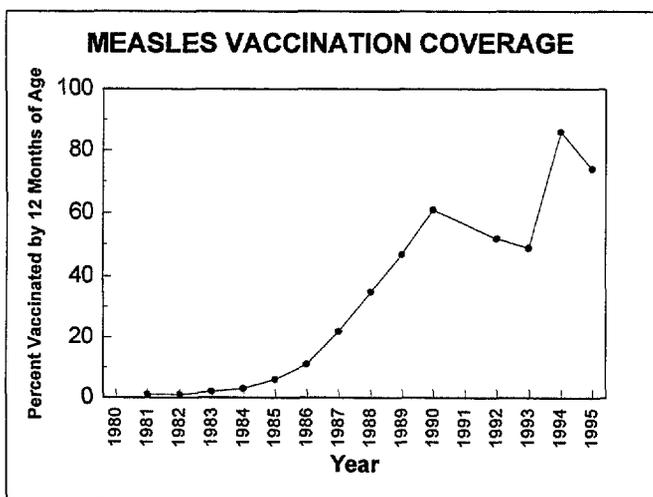
### Vaccination Coverage Rates



BCG COVERAGE		
YEAR	PERCENT	SOURCE
1980	2	WHE8700
1981	3	WHE8701
1982	3	WHE8701
1983	5	WHE8701
1984	8	WHE8801
1985	12	WHE8700
1986	22	WHE8800
1987	46	WHE8801
1988	54	WHE8900
1989	63	MRF8903
1990	76	DHS9107
1991	66	WHE9100
1992	60	WHE9301
1993	61	WHE9403
1994	88	WHE9502
1995	88	WHE9601

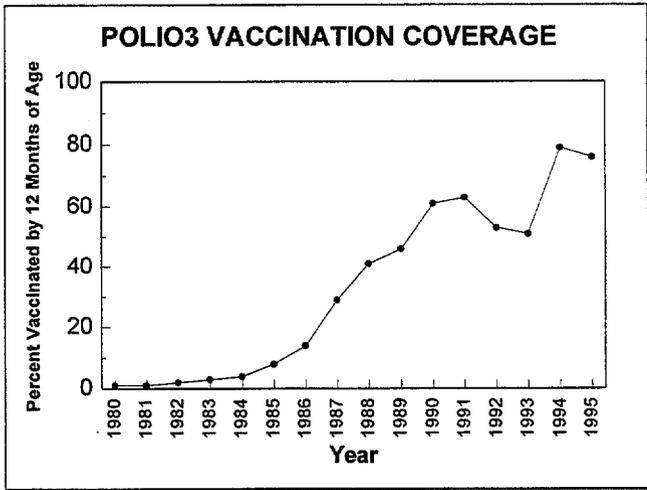


DPT3 COVERAGE		
YEAR	PERCENT	SOURCE
1980	1	WHE8700
1981	1	WHE8700
1982	2	WHE8700
1983	3	WHE8700
1984	4	WHE8700
1985	8	WHE8700
1986	14	WHE8701
1987	29	WHE8801
1988	41	WHE8900
1989	46	MRF8903
1990	60	DHS9107
1991	NA	
1992	53	WHE9301
1993	51	WHE9403
1994	77	WHE9502
1995	76	WHE9601

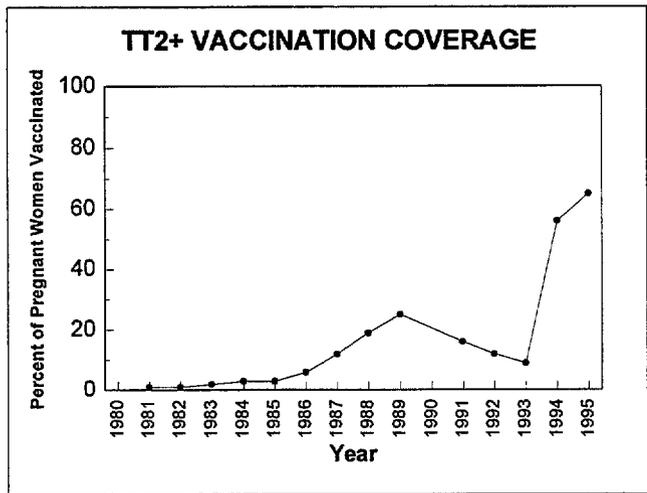


MEASLES COVERAGE		
YEAR	PERCENT	SOURCE
1980	NA	
1981	1	WHE8701
1982	1	WHE8701
1983	2	WHE8701
1984	3	WHE8701
1985	6	WHE8700
1986	11	WHE8701
1987	22	WHE8801
1988	35	WHE8900
1989	47	MRF8903
1990	61	DHS9107
1991	NA	
1992	52	WHE9301
1993	49	WHE9403
1994	86	WHE9502
1995	74	WHE9601

Vaccination Coverage Rates, continued

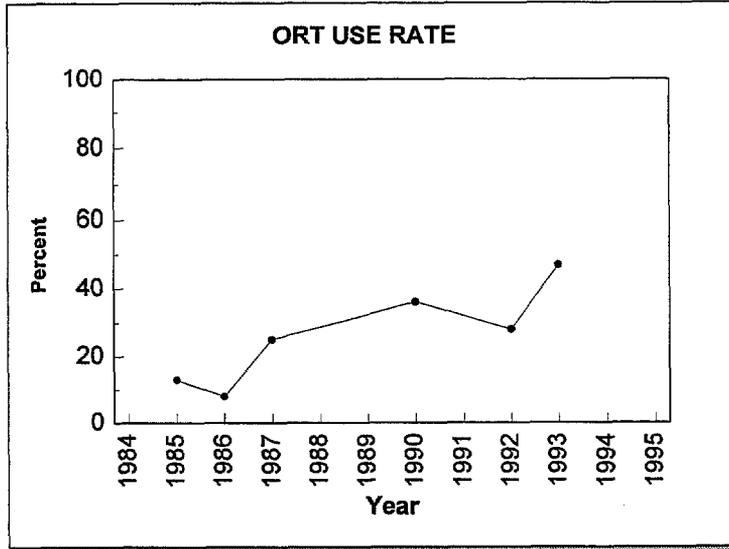


POLIO3 COVERAGE		
YEAR	PERCENT	SOURCE
1980	1	WHE8700
1981	1	WHE8700
1982	2	WHE8701
1983	3	WHE8700
1984	4	WHE8700
1985	8	WHE8700
1986	14	WHE8701
1987	29	WHE8801
1988	41	WHE8900
1989	46	MRF8903
1990	61	DHS9107
1991	63	WHE9100
1992	53	WHE9301
1993	51	WHE9403
1994	79	WHE9502
1995	76	WHE9601



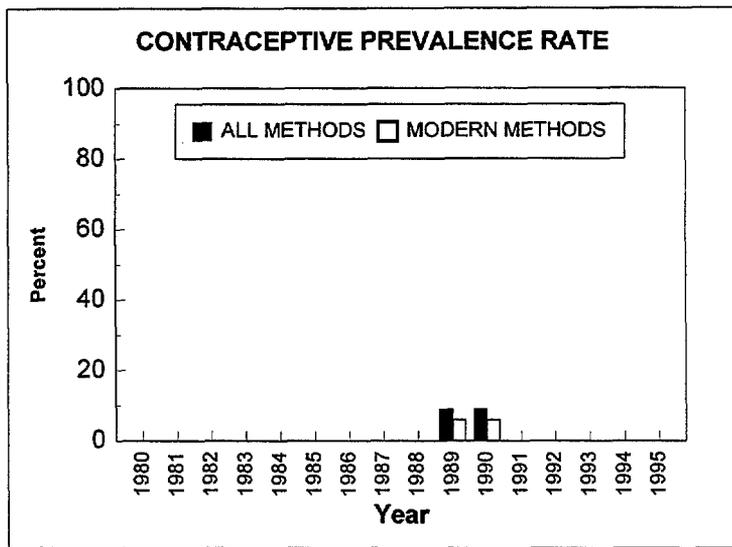
TT2+ COVERAGE		
YEAR	PERCENT	SOURCE
1980	NA	
1981	1	WHE8701
1982	1	WHE8701
1983	2	WHE8701
1984	3	WHE8801
1985	3	WHE8701
1986	6	WHE8701
1987	12	WHE8801
1988	19	WHE8900
1989	25	WHE9001
1990	NA	
1991	16	WHE9100
1992	12	WHE9301
1993	9	WHE9403
1994	56	WHE9502
1995	65	WHE9601

### ORT Use Rate



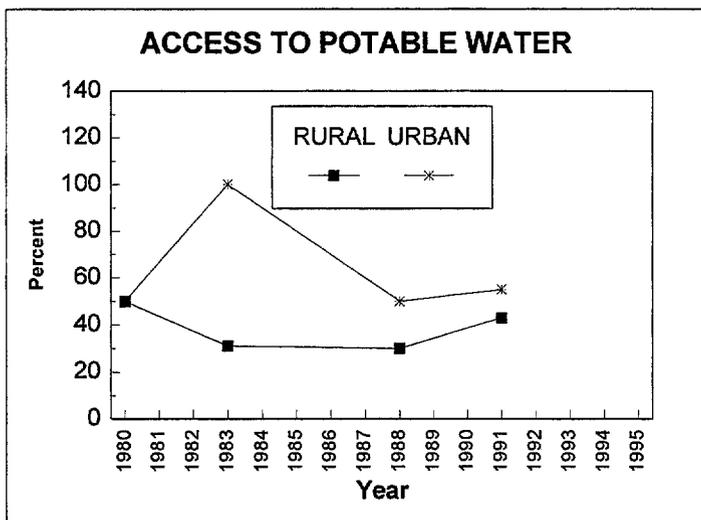
ORT USERATE		
YEAR	PERCENT	SOURCE
1984	NA	
1985	13	WHD8700
1986	8	WHD8800
1987	25	WHD8900
1988	NA	
1989	NA	
1990	36	DHS9002
1991	NA	
1992	28	WHD9300
1993	47	WHD9401
1994	NA	
1995	NA	

### Contraceptive Prevalence Rate



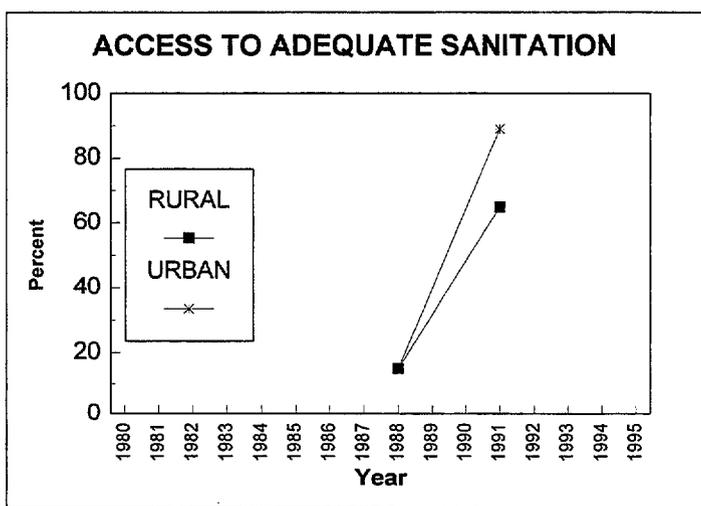
YEAR	ALL METHODS		MODERN METHODS	
	SOURCE		SOURCE	
1980	NA		NA	
1981	NA		NA	
1982	NA		NA	
1983	NA		NA	
1984	NA		NA	
1985	NA		NA	
1986	NA		NA	
1987	NA		NA	
1988	NA		NA	
1989	9	BUC9401	6	BUC9401
1990	9	DHS9107	6	DHS9107
1991	NA		NA	
1992	NA		NA	
1993	NA		NA	
1994	NA		NA	
1995	NA		NA	

### Access to Potable Water



YEAR	RURAL	SOURCE	URBAN	SOURCE
1980	50	AID9012	50	AID9012
1981	NA		NA	
1982	NA		NA	
1983	31	WHO9101	100	WHO9101
1984	NA		NA	
1985	NA		NA	
1986	NA		NA	
1987	NA		NA	
1988	30	AID9012	50	AID9012
1989	NA		NA	
1990	NA		NA	
1991	43	JMP9301	55	JMP9301
1992	NA		NA	
1993	NA		NA	
1994	NA		NA	
1995	NA		NA	

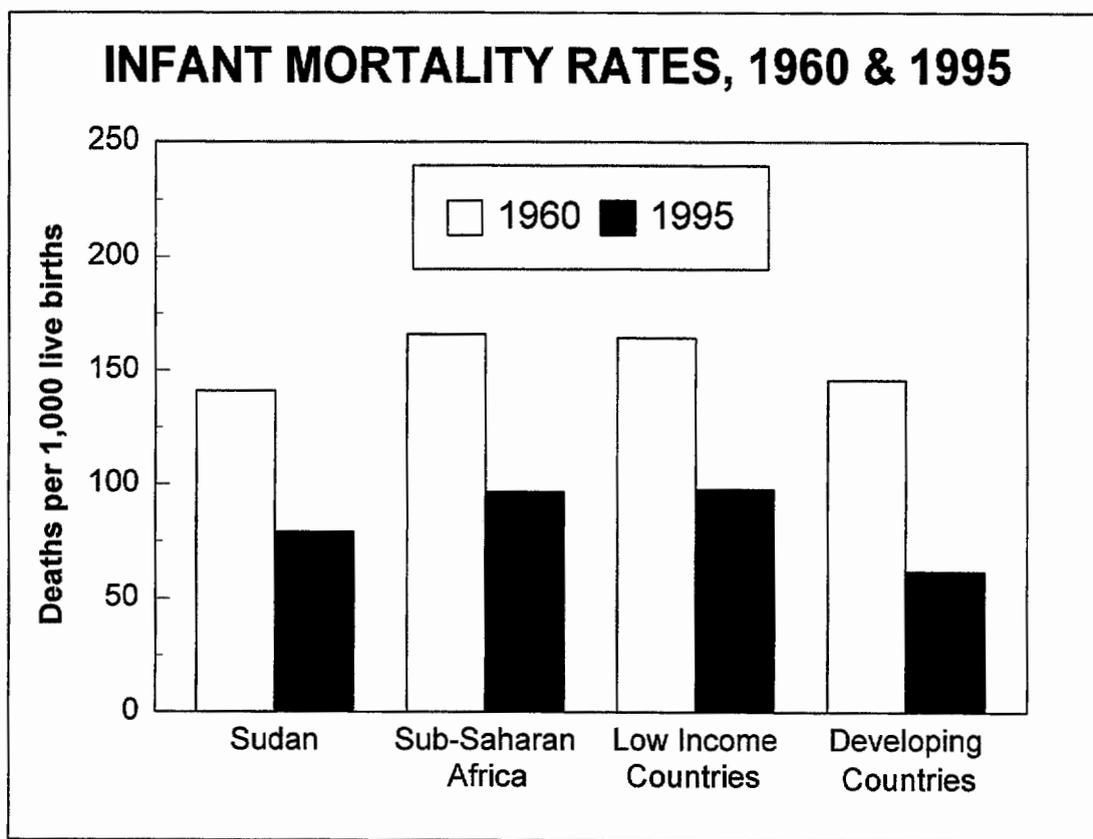
### Access to Adequate Sanitation



YEAR	RURAL	SOURCE	URBAN	SOURCE
1980	NA		NA	
1981	NA		NA	
1982	NA		NA	
1983	NA		NA	
1984	NA		NA	
1985	NA		NA	
1986	NA		NA	
1987	NA		NA	
1988	15	AID9012	15	AID9012
1989	NA		NA	
1990	NA		NA	
1991	65	JMP9301	89	JMP9301
1992	NA		NA	
1993	NA		NA	
1994	NA		NA	
1995	NA		NA	

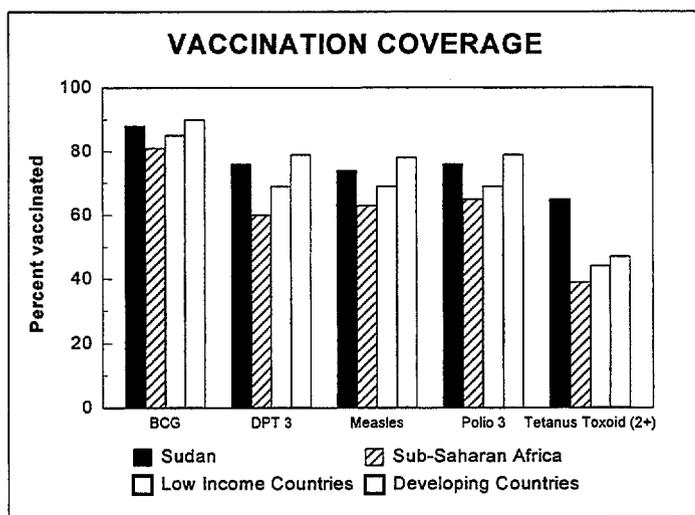
## COMPARATIVE INDICATORS

### Comparative Infant Mortality Rates



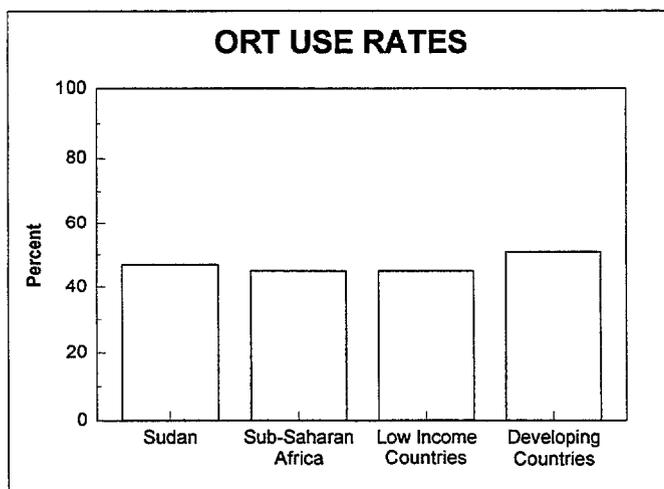
YEAR	1960	1995	Source
Sudan	141	79	BUC9302
<i>Median values for country groupings:</i>			
Sub-Saharan Africa	166	97	CAL9606
Low Income Countries	165	98	CAL9606
Developing Countries	146	62	CAL9606

## Comparative Vaccination Coverage Rates



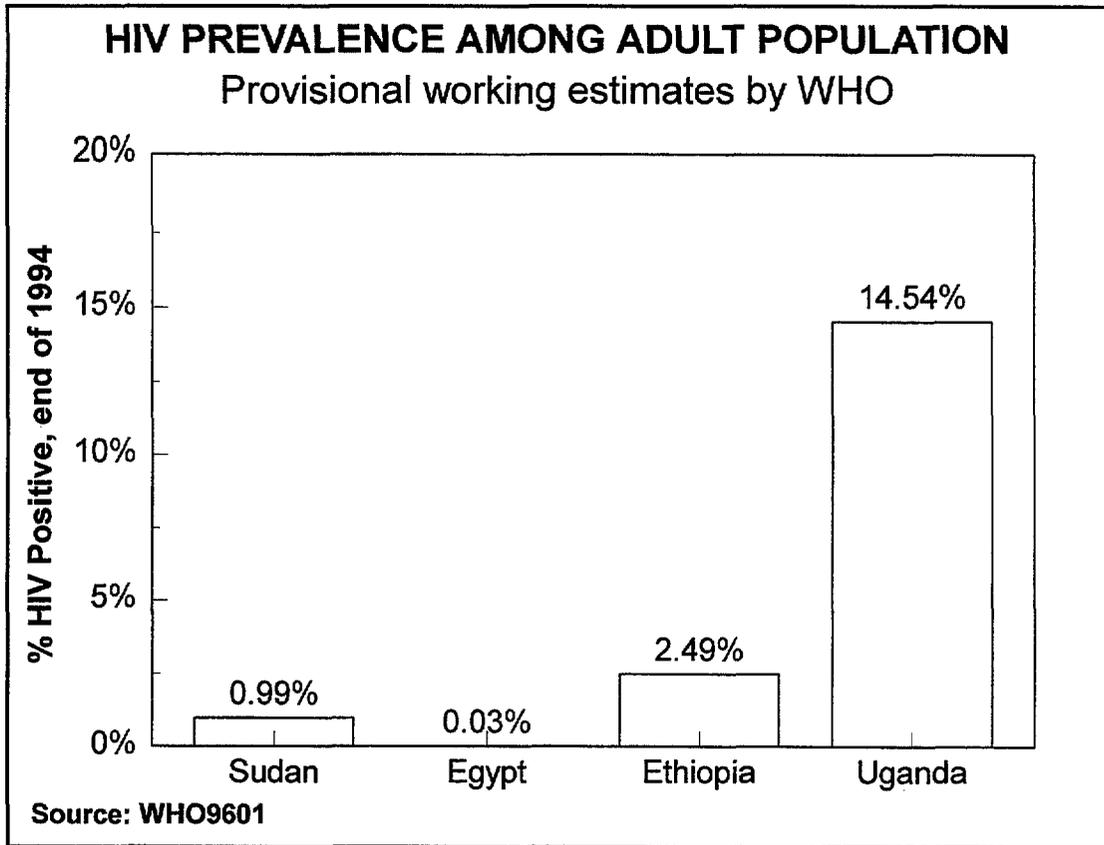
Vaccination Coverage	Sudan	Year	Source	Median values for country groupings: (CAL9606)		
				Sub-Saharan Africa	Low Income Countries	Developing Countries
BCG	88	1995	WHE9601	81	85	90
DPT 3	76	1995	WHE9601	60	69	79
Measles	74	1995	WHE9601	63	69	78
Polio 3	76	1995	WHE9601	65	69	79
Tetanus Toxoid (2+)	65	1995	WHE9601	39	44	47

## Comparative ORT Use Rates



COUNTRY	ORT USE RATE	YEAR
Sudan	47	1993
Source	WHD9401	
<i>Median values for country groupings:</i>		
Sub-Saharan Africa	45	1995
Low Income Countries	45	1995
Developing Countries	51	1995
Source	CAL9606	

## Human ImmunodeficiencyVirus (HIV) Prevalence Rates



## II: DATA NOTES

### *I. Note On Mortality Estimation*

Various organizations produce mortality estimates for the developing countries and regions. The three largest sources are the United Nations Population Division, the World Bank and the United States Bureau of the Census. CIHI's Health Statistics Database draws upon the work of these three larger organizations as well as other sources in order to reconcile the various estimates and provide the most reasonable current and historical estimates available.

CIHI has also created the only comprehensive time series of under-five mortality estimates for all developing countries. This has been accomplished by developing mathematical equations from empirical data that describe the relationship between infant and under-five mortality. Using these equations it is possible to make estimates of under-five mortality from infant mortality or *vice-versa*. More details regarding CIHI's methodology for specific data sets are provided in the source references.

### *II. Definitions*

#### *Demographic indicators:*

**Annual Infant Deaths:** An estimate of the number of deaths occurring to children under age one in a given year.

**Average Annual Rate of Population Growth:** An estimate of the rate at which a population is increasing (or decreasing) in a given year.

**Children Under Age 1:** Mid-year estimate of the total number of children under age one.

**Contraceptive Prevalence Rate:** Estimate of the proportion of women

aged 15 through 44 (sometimes 15 through 49) currently using a modern method of contraception. For some countries, this data is only available for women in union or married. Where sources fail to distinguish modern and traditional methods, the combined rate is shown.

**Crude Birth Rate:** An estimate of the number of live births per 1,000 population in a given year.

**Crude Death Rate:** An estimate of the number of deaths per 1,000 population in a given year.

**Infant Mortality Rate:** The estimated number of deaths in infants (children under age one) in a given year per 1,000 live births in that same year. This rate may be calculated by direct methods (counting births and deaths) or by indirect methods (applying well-established demographic models).

**Life Expectancy At Birth:** An estimate of the average number of years a newborn can expect to live. Low life expectancies in developing countries are in large part due to high infant mortality.

**Maternal Mortality Rate (or Ratio):** Estimated number of maternal deaths per 100,000 live births where a maternal death is one which occurs when a woman is pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management. Extremely difficult to measure, maternal mortality can be derived from vital registration systems (usually underestimated), community studies and surveys (requires very large sample sizes) or hospital registration (usually overestimated).

**Total Population:** Mid-year estimate of total number of individuals in a country.

**Total Fertility Rate:** Estimate of the average number of children a woman

would bear during her lifetime given current age-specific fertility rates.

**Under 5 Mortality Rate:** The estimated number of children born in a given year who will die before age five per 1,000 live births in that same year. May be calculated by direct or indirect methods.

**Urban Population:** Population living in urban areas as defined according to the national definition used in the most recent population census.

#### *Child survival indicators:*

**Adequate Nutritional Status:** An individual child of a certain age is said to be adequately nourished if his/her weight is greater than the weight corresponding to "two Z-scores" (two standard deviations) below the median weight achieved by children of that age. The median weight and the distribution of weights around that median in a healthy population are taken from a standard established by the National Center for Health Statistics, endorsed by WHO. The indicator for the population as a whole is the proportion of children 12 through 23 months of age who are adequately nourished.

**Complementary Feeding:** An estimate of the proportion of infants six to nine months of age (181 days to 299 days) still breastfeeding but also receiving complementary weaning foods.

**Continued Breastfeeding:** An estimate of the proportion of children breastfed for at least one year. Values presented in this report are the proportion of children 12 to 15 months of age at the time of the survey still receiving breast milk.

**DPT Drop-out Rate:** An estimate of the proportion of living children between the ages of 12 and 23 months

who received at least one DPT vaccination but who did not receive the entire series of three vaccinations before their first birthdays.

**Exclusive Breastfeeding:** An estimate of the proportion of infants less than four months (120 days) of age who receive no foods or liquids other than breast milk.

**ORS Access Rate:** An estimate of the proportion of the population under age five with reasonable access to a trained provider of oral rehydration salts who receives adequate supplies. This indicator is particularly difficult to measure and may fluctuate dramatically as various methods of estimation are devised.

**ORT Use Rate:** Estimate of the proportion of cases of diarrhea in children under five treated with **ORS and/or RHF** (a recommended home fluid). ORT use may be determined using administrative means or surveys. Administrative estimates are generally based on estimates of the number of episodes of diarrhea in the target population for a given year and the quantity of ORS available; these estimates are highly sensitive to changes in estimates of the frequency of diarrhea episodes. Surveys more precisely focus on the actual behavior of mothers in treating diarrhea in the two-week period prior to the survey.

**Vaccination Coverage In Children:** Estimate of the proportion of living children between the ages of 12 and 23 months who have been vaccinated before their first birthday (three times in the cases of polio and DPT and once for both measles and BCG). Rates are calculated in two ways: Administrative estimates are based on reports of the number of inoculations of an antigen given during a year to children who have not yet reached their first birthday divided by an estimate of the pool of children under one year of age eligible for vaccination. Survey estimates are based on samples of children between the ages of 12 and 23 months.

**Vaccination Coverage In Mothers:** Estimate of the proportion of women in a given time period who have received two doses of tetanus toxoid (TT) during their pregnancies. A revised indicator, referred to as **TT2+**, is now commonly used to account for the cumulative effect of TT boosters. A woman and her baby are protected against tetanus when a mother has had only one or perhaps no boosters during a given pregnancy so long as the woman had received the appropriate number of boosters in the years preceding the pregnancy in question. (This number varies with number received previously and the time elapsed.) Rates are computed using administrative methods or surveys.

#### **Other health sector indicators:**

**Access to Adequate Sanitation:** Definitions vary over time. In the past, this has been an estimate of the proportion of the population with sanitation service provided through sewer systems or individual in-house or in-compound excreta disposal facilities (latrines). After WHO changed its indicators and definitions in the late 1980s, this is now defined as the proportion with reasonable access to sanitary means of excreta and waste disposal, including outdoor latrines and composting.

**Access to Health Services:** An estimate of the proportion of the population that can reach appropriate local health services by local means of transport in no more than one hour. Recently WHO has revised its definition to the proportion of the population having treatment for common diseases and injuries and a regular supply of the essential drugs on the national list within one hour's walk or travel.

**Access to Safe Water:** Proportion of the population with reasonable access to safe water supply, including treated surface waters or untreated but uncontaminated water such as that from

springs, sanitary wells or protected boreholes. Reporting can be highly subjective. Varying definitions are used for reasonable access in urban/rural areas:

**Access to Safe Water, Urban:** Estimate of the proportion of all persons living in urban areas (defined roughly as population centers of 2,000 or more persons) who live within 200 meters of a standpipe or fountain source of water.

**Access to Safe Water, Rural:** Estimate of the proportion of all persons not living in urban areas with a source of water close enough to home that household members do not spend a disproportionate amount of time fetching water.

**Births Attended by Trained Personnel:** An estimate of the proportion of births attended by at least one physician, nurse, midwife, trained primary health care worker, or trained birth attendant.

**HIV Prevalence:** Estimate of the proportion of a given population infected with HIV.

### III: SOURCES

- AID9012 Water and Sanitation for Health Project, U.S. Agency for International Development. Water and Sanitation Sector Profiles of Twenty African Countries, June 1989.
- BUC9302 Time series estimates of Infant Mortality generated by applying the ratio of the BUCEN estimate for 1992 to the World Population Prospects estimate for 1992 to the annual values dating back to 1950 as estimated in the World Population Prospects. Under 5 Mortality estimates are calculated by applying the appropriate Coale-Demeny model to the Infant Mortality estimates.
- BUC9401 U.S. Bureau of the Census (BUCEN). International Data Base. Version dated March, 1994.
- CAL9512 Calculated medians for aggregates of countries using best available data from the CIHI Health Statistics Database.
- CAL9602 Calculations of the annual number of women in the population ages 15-49. For each country, a percentage was derived from UN data on total population and women 15-49 and the percentage was then applied to the preferred estimate of total population.
- CAL9603 Calculated number of live births to women of reproductive years (15-49) in 1995. Calculated from the population multiplied by the crude birth rate for each country.
- CAL9604 Calculated number of deaths occurring to children under the age of 1 in a given year (1995). Figures based on the number of births multiplied by the infant mortality rate.
- CAL9606 Median value for aggregate of countries. Calculated using most recent preferred indicator values for all countries in the aggregate.
- DHS9002 Ministry of Economic and National Planning. Sudan Demographic and Health Survey 1989-90: Preliminary Report. Columbia, MD: IRD, 1990.
- DHS9107 Department of Statistics, Ministry of Economic and National Planning and Institute for Resource Development/Macro International, Inc. Sudan Demographic and Health Survey 1989/1990. Columbia, MD: IRD, 1991.
- JEE9504 Under-five mortality (5q0) calculated from infant mortality (q0) using "other sub-Saharan Africa" equation (i.e. excluding West Africa):  $5q0 = 1.35622 * (q0)^{1.04864}$ .
- JMP9301 WHO/UNICEF Joint Monitoring Programme. Water Supply and Sanitation Sector Monitoring Report 1993. Sector Status as of December 1991. WHO and UNICEF. August, 1993.
- MRF8903 Coverage survey, 1989 as cited in the FY 1989 Mission Response form.
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