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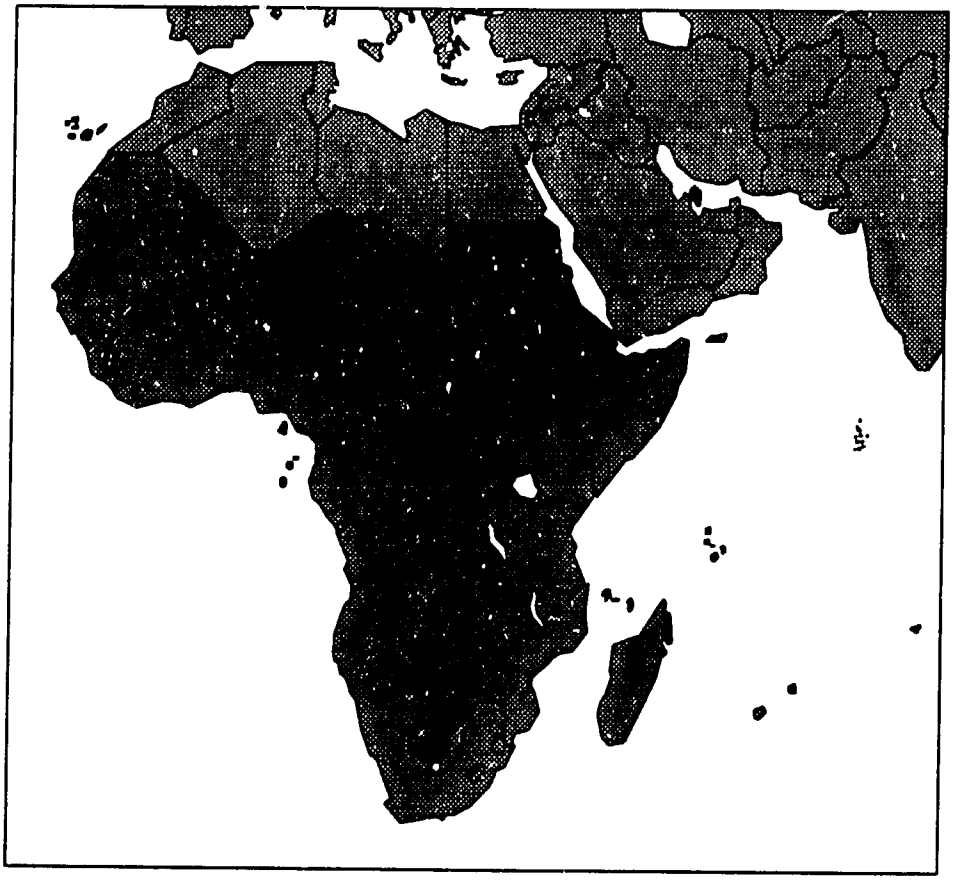
*CIHI Country Health Profile Series*

# NIGER

## Country Health Profile
## 1995



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# NIGER

## Country Health Profile

This is one of a series of Country Health Profiles produced by the Center for International Health Information (CIHI). Each profile provides quantitative and qualitative data on current health and demographic conditions and the health care system 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 Country Health Profiles, along with 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 other country health profiles and health statistics reports, or look for these reports on the Internet at the following address: *gopher.info.usaid.gov*.

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.

# CURRENT DEMOGRAPHIC AND HEALTH INDICATORS

| Demographic Indicators | | | |
|---|---|---|---|
| INDICATOR | VALUE | YEAR | SOURCE |
| Total Population | 8,867,000 | 1994 | UNP9400 |
| Urban Population | 1,475,469 | 1994 | CALXX04 |
| Women Ages 15-49 | 1,943,800 | 1994 | UNP9400 |
| Infant Mortality | 121 | 1994 | UNP9400 |
| Under 5 Mortality | 241 | 1994 | JEE9502 |
| Maternal Mortality | 671 | 1992 | DHS9306 |
| Life Expectancy At Birth | 47 | 1994 | UNP9400 |
| Number of Births | 459,816 | 1994 | CALXX00 |
| Annual Infant Deaths | 55,698 | 1994 | UNP9400 |
| Total Fertility Rate | 7.3 | 1994 | UNP9400 |

| Child Survival Indicators | | | |
|---|---|---|---|
| INDICATOR | PERCENT | YEAR | SOURCE |
| Vaccination Coverage | | | |
| BCG | 35 | 1992 | DHS9306 |
| DPT 3 | 17 | 1992 | DHS9306 |
| Measles | 20 | 1992 | DHS9306 |
| Polio 3 | 17 | 1992 | DHS9306 |
| Tetanus 2 | 14 | 1992 | DHS9306 |
| DPT Drop Out | 46 | 1992 | DHS9306 |
| Oral Rehydration Therapy | | | |
| ORS Access Rate | 65 | 1992 | WHD9300 |
| ORS and/or RHF Use | 17 | 1992 | DHS9206 |
| Contraceptive Prevalence | | | |
| Modern Methods (15-44) | 2 | 1992 | DHS9306 |
| All Methods (15-44) | 4 | 1992 | DHS9306 |
| Nutrition | | | |
| Adequate Nutritional Status | 47 | 1992 | DHS9306 |
| Appropriate Infant Feeding | NA | | |
| A) Exclusive Breastfeeding | NA | | |
| B) Complementary Feeding | NA | | |
| Continued Breastfeeding | NA | | |

| Other Health Indicators | | | |
|---|---|---|---|
| INDICATOR | PERCENT | YEAR | SOURCE |
| HIV-1 Seroprevalence | | | |
| Urban | 1.3 | 1993 | BUC9503 |
| Rural | 1.4 | 1992 | BUC9503 |
| Access to Safe Water | | | |
| Urban | 36 | 1988 | AID9012 |
| Rural | 49 | 1988 | AID9012 |
| Access to Sanitation | | | |
| Urban | 36 | 1988 | AID9012 |
| Rural | 3 | 1988 | AID9012 |
| Deliveries/Trained Attendants | 33 | 1992 | DHS9306 |

*NA = Data not available.*
*For definitions of indicators, see data notes in Appendix B. For full citations of sources, see Appendix C.*

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# Acronyms/Abbreviations

| | |
|---|---|
| AIDS | acquired immune deficiency syndrome |
| ARI | acute respiratory infection |
| BCG | Bacillus of Calmette and Guérin vaccine (to prevent tuberculosis) |
| DPT3 | diphtheria, pertussis, tetanus vaccine (three shots) |
| CDC | U.S. Centers for Disease Control |
| CIHI | Center for International Health Information |
| DDS | Departmental Health Division |
| DHS | Demographic and Health Survey |
| GDP | gross domestic product |
| GNP | gross national product |
| HIV | human immunodeficiency virus |
| IMR | infant mortality rate |
| MSP | *Ministère de la Santé Publique* (Ministry of Public Health) |
| NGO | non-government organization |
| ORS | oral rehydration salts |
| ORT | oral rehydration therapy |
| PHC | primary health care |
| PRICOR | Primary Health Care Operations Research Project (USAID) |
| PRITECH | Technologies for Primary Health Care Project (USAID) |
| REACH | Resources for Child Survival (REACH) Project (USAID) |
| RHF | recommended home fluid (for ORT) |
| STD | sexually-transmitted disease |
| TB | tuberculosis |
| TBA | traditional birth attendant |
| TT | tetanus toxoid vaccine (see data notes for TT2+) |
| UNDP | United Nations Development Program |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| U5MR | under-five mortality rate |
| WHO | World Health Organization |

# EDITOR'S NOTES

***1. 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 Appendix C.*

***2. Statistical Appendix.*** *Much of the quantitative data presented in graph form in this profile also appears in tabular form with specific references in Appendix A.*

***3. Data Notes.*** *For definitions of indicators and commentary regarding their derivation, the reader is referred to Appendix B.*

***4. Comparative Graphs.*** *Unless specified otherwise, indicator values for country groupings are median values for groups of available country-level values. Where no date is specified, values used refer to most recent available data. The groups are composed as follows: "Sub-Saharan Africa" includes available data for 47 countries comprising USAID's Africa Region, which does not include Egypt, Libya, Tunisia, Algeria, Morocco, and Western Sahara. "Low-income Countries" includes available data for 54 countries classified as such in the World Bank's World Development Report 1993 (WDR 1993). "Developing Countries" indicators are drawn from available data for the 152 nations not classified as "Established Market Economies" in the WDR 1993.*

# I. COUNTRY OVERVIEW

## Geography

The Republic of Niger is the largest state in West Africa with a total area of 1.27 million km$^2$ (489,000 miles$^2$). Niger shares international boundaries with seven neighbors: Algeria, Mali, Burkina Faso, Benin, Nigeria, Chad, and Libya (see map inside back cover). Two-thirds of the country is desert and most of the north-eastern region is uninhabitable. The lifeline of the country is the Niger River, which flows 300 km. (186 miles) through the southwest of the country. Niger also shares Lake Chad with Nigeria, Chad, and Cameroon. Of the total land area, just 2.9 percent is agricultural. The country is divided into seven departments and a special district around the capital, Niamey (see figure 1.1). Departments are divided into smaller units known as *arrondissements*.

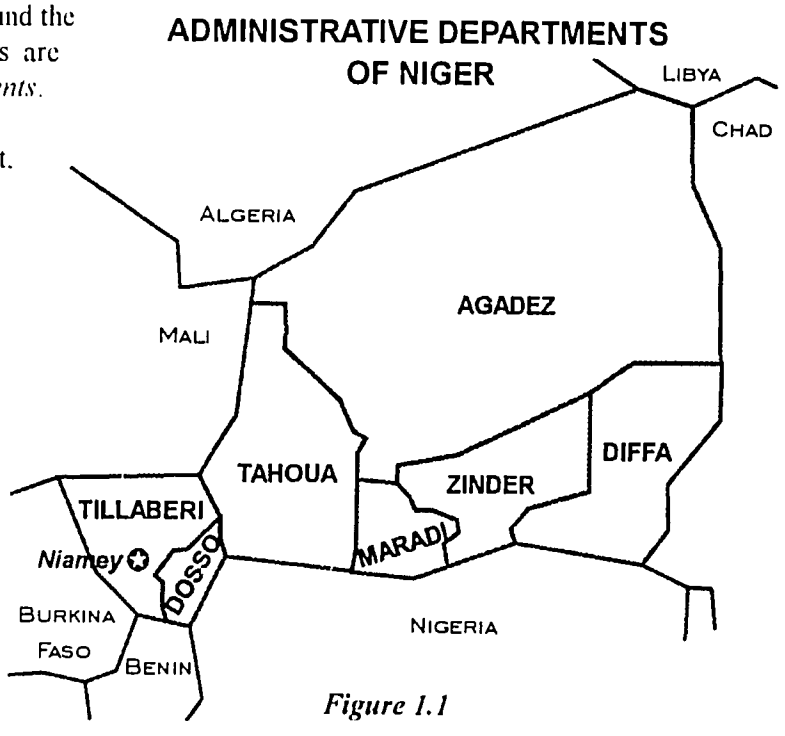



*Figure 1.1*

Niger is in one of the hottest regions on the planet, with temperatures often rising to 50 degrees C. (122 degrees F.), so intense that rain frequently evaporates before it reaches the ground. From November to February the weather is dry and relatively cool, with temperatures often dropping below 30 degrees C (85 degrees F). The rainy season lasts from June to October in the south, with maximum rainfall in August. Annual rainfall averages 50 cm. (29 in.) in the south, drops below 20 cm. (8 in.) in the subdesert (Sahelian) zone to the north and east, and only reaches a maximum of 10 cm. (4 in.) in good years in the desert (Saharan) zone further north. The prevailing wind, the *harmattan*, parches all living things during the dry months (FOF9201).

## People & History

Niger's most numerous ethnic group is the Hausa, who inhabit the center and south of the country with some 56 percent of the national population. Next are the Djerma-Songhai in the southwest (22 percent). Important nomadic groups include the Fulani (or Peulhs) in the South and Tuaregs in the north (roughly eight percent each). Nomads lack equal access to government services because of their transient lifestyle and due to historical animosities with the two major sedentary groups, which dominate the government. French is the official language, but Hausa and Djerma are much more widely spoken. The vast majority of the population practices Islam; about 14 percent is believed to practice traditional religions and less than one percent is Christian (FOF9201).

Formerly a part of French West Africa, Niger gained independence from France on August 3, 1960. A military government seized power in 1974, obtained the withdrawal of French troops, and reduced French influence over the exploitation of Niger's uranium deposits. While maintaining friendly relations with the former colonial power, the government also formed new links with Arab states. In March 1993, thirty years of military, one-party rule ended with fair and peaceful elections installing a multi-party national assembly with Mohamane Ousmane as president. Lacking a strong majority, the government was dissolved in October 1994 and eventually replaced through a second set of elections in January 1995 (AID9506).

Although public participation has been high, Niger's initial experience with democracy has been difficult as weakly-formed coalition governments have grappled with serious public finance and management problems. Other major difficulties faced by the government include frequent strikes by civil servants, who have routinely gone without pay for up to six months, and armed rebellion by Tuareg groups in the north. A peace agreement negotiated with the rebels has held since October 1994 (AID9506).

## Social and Economic Conditions

Economic success in Niger depends on two major external factors: the weather and the state of affairs in neighboring Nigeria. After decades of struggle, Niger turned in a relatively prosperous year in 1994, with gross domestic product (GDP) growing roughly 2.6 percent, largely thanks to excellent rainfall, appreciation of the Nigerian naira, and the devaluation of the CFA franc in January 1994, benefitting rural producers and exporters. In the public sector, however, outlays far outstripped revenues, despite the relatively small size of the Nigerienne government. Fiscal problems led the International Monetary Fund to suspend access to loans in late 1994 and threatened the World Bank's adjustment programs in Niger (AID9506).

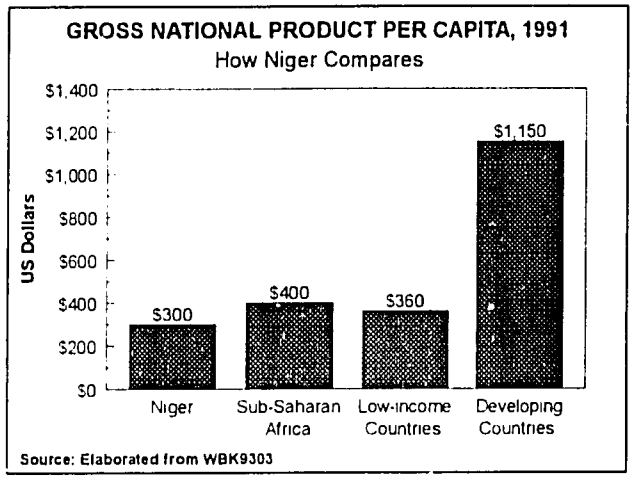



*Figure 1.2*

As indicated in figure 1.2, gross national product (GNP) per person was estimated by the World Bank at just US $300 per person in 1990, considerably below the median level among sub-Saharan nations (WBK9303). Agriculture accounts for roughly 40 percent of GDP. Because of the instability of agricultural employment and the large presence of nomads, enumeration of the economically active population presents statistical difficulties. It is generally estimated that about 90 percent of the economically active population is employed in agriculture, including livestock-raising (FOF9201).

Cultivation is limited to a narrow strip of land along the Niger River and the border with Nigeria. Cash crops include cowpeas, cotton, and peanuts; subsistence crops include millet, sorghum, cassava, and rice. Agricultural techniques are primitive as mechanization and fertilizer application are virtually unknown. Even before Niger was beset with devastating droughts in the 1970s and 1980s, population growth rate outpaced agricultural production and the nation was not self-sufficient in foodstuffs. A government campaign to encourage production of out-of-season crops such as potatoes, haricot beans, and cassava was launched in 1984 in an effort to offset the cereal deficit. Nevertheless, subsequent droughts, locust infestations, desertification, and overgrazing have undermined Niger's attempts to become self-sufficient. Livestock – primarily cattle, sheep, and goats – suffered severely during the droughts of the 1970s. The government initiated a program to reconstitute the herds, but subsequent drought destroyed them again. Another rebuilding effort was begun in 1986. Livestock was once an important source of foreign exchange earnings and the destruction of the herds has dealt a severe blow to the economy (FOF9201).

The economy also depends heavily on the exploitation of large uranium deposits, which constitute Niger's only major valuable export. In the 1970s, demand for uranium to build nuclear weapons as well as commercial reactors led to Niger's boom years. At that time, the country was encouraged by its foreign (mainly French) customers to invest heavily in mining, infrastructure, and other costly developments. There was every confidence that the debts thus incurred could be met through the export of yellow cake – a semi-processed form of ore. However, in the 1980s, world prices for uranium collapsed from forty to just seven dollars per pound and Niger's boom came to a rapid end (FOF9201).

## Population Dynamics

The relatively small size of Niger's population, currently estimated at about eight million, is largely explained by the country's aridity and remoteness. The overall population density is just 6.6 persons per km² (17.0 per mi.²). Nearly 90 percent of the population is concentrated along the Niger River, where density approaches 60 to 70 persons per km² (155 to 181 per mi.²). The density falls to about 15 per km² (39 per mi.²) in the Southeast and to less than 1 per km² (2.5 per mi.²) in the North (FOF9201)(see figure 1.3).

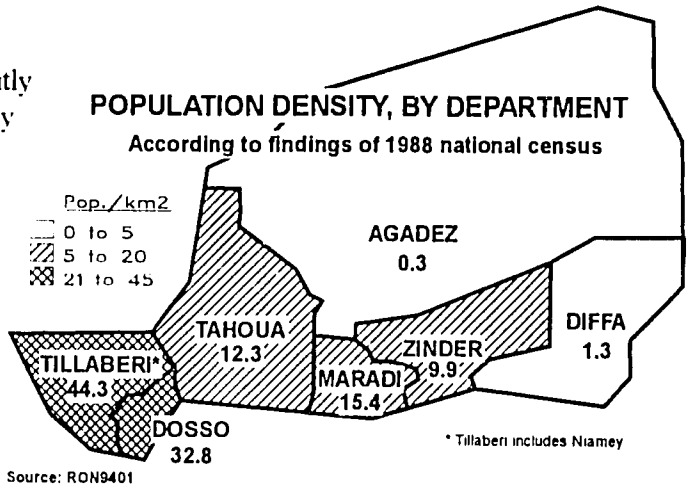



*Figure 1.3*

The population is thought to be growing at an annual rate of 2.9 percent and is projected by the United Nations (UN) to surpass ten million by the year 2000 (see figure 1.4). The crude birth rate remains extremely high, holding at about 52 births per 1,000 population since 1970, according to estimates by the United Nations, while the crude death rate has steadily lowered (UNP9400)(see table A1 in Appendix).

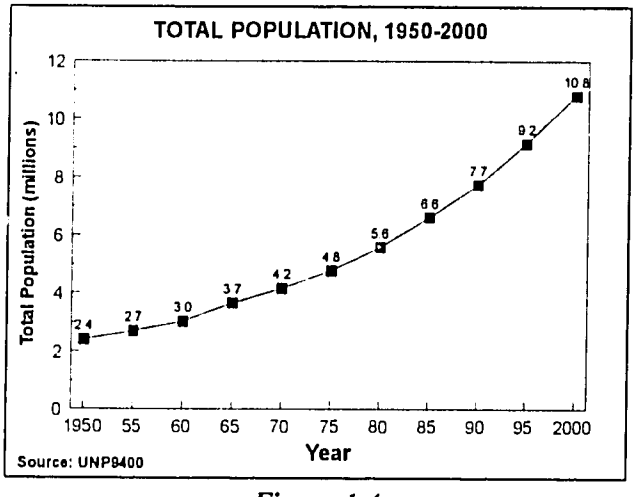



*Figure 1.4*

Niger's Demographic and Health Survey (DHS), conducted in 1992, found a total fertility rate (TFR) of 7.4 children per woman for 1983-92, the highest rate found by any DHS in sub-Saharan Africa. This is comparable to the rate of 7.5 found by the last national census in 1988. An even more striking finding by the DHS was that the *desired* number of children was even higher than the TFR at 8.5, a phenomenon unique to Niger (AID9506). Not surprisingly, contraceptive prevalence rates found by the DHS are among the world's lowest at just 2.2 percent among women ages 15 through 49 for modern methods and 4.4 percent for all methods of contraception (DHS9306). According to estimates by the U.S. Bureau of the Census, in 1990 about one-fifth of the population (20.5 percent) was under the age of five years and nearly half (48.5 percent) was under the age of fifteen (see figure 1.5).

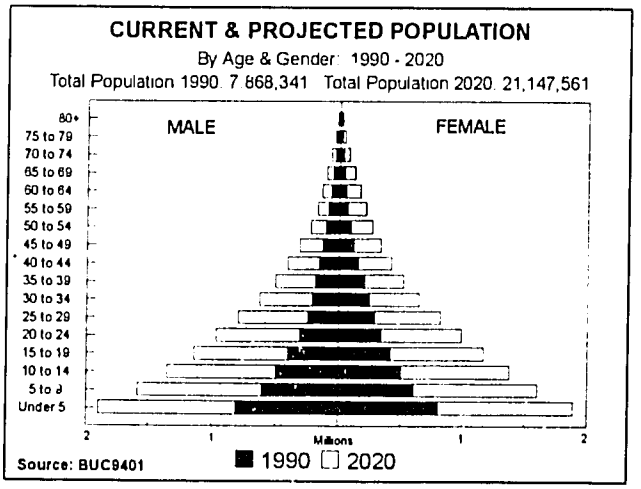



*Figure 1.5*

According to the UN Population Division, Niger is among the least urbanized nations in the world. An estimated 83 percent of its population lives either in rural areas or as nomads (UNP9400). Other than the capital, Niamey, with a population estimated at 432,000 in 1991 (AID9214), there are no population centers with over 100,000 inhabitants, and only seven towns have over 15,000 inhabitants. The annual growth rate in urban areas for 1985-90 was 6.7 percent. Migration is a way of life for all nomads, and borders are relatively meaningless, artificial restrictions. However, by the same token, most nomads eventually return home and show no inclination to settle in other countries (FOF9201).

# II. HEALTH SITUATION ANALYSIS

## Basic Health Indicators

The 1994 Human Development Report listed Niger's life expectancy at birth at just 46 years for 1992, well below the median of 50 among sub-Saharan African nations (see figure 2.1)(UND9402). To a large extent, lower life expectancy in Niger and other developing nations is a result of high infant and child mortality. Projections based on DHS data place Niger's infant mortality rate (IMR) at 119 deaths per thousand live births and the under-five mortality rate (U5MR) at 237, more than three times higher than the median value among developing nations around the world (see figure 2.2). These rates represent a considerable improvement over the past (see figure 2.3), but are still among Africa's highest.

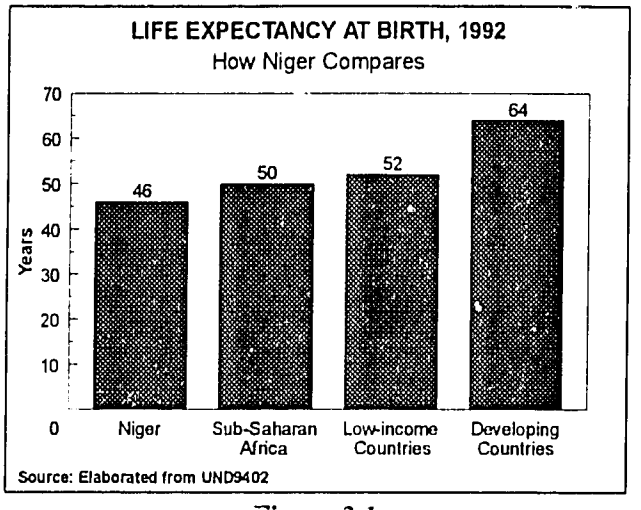



*Figure 2.1*

The 1992 DHS found significant differences in infant and under-five mortality according to area of residence. Because sample sizes are smaller, the data used to report regional mortality rates is based on the ten-year period preceding the survey. In Niamey, the U5MR was calculated at just 157 deaths per thousand live births, less than half of the national rate of 326. U5MRs in all other regions were found to be at least 280, reaching as high as 390 in Maradi. In rural areas, the U5MR was estimated at 347. This means that more than one-third of rural infants die before their fifth birthday. IMRs ranged from 99 in Niamey to over 200 in the five easternmost regions (DHS9306) (see figure 2.4).

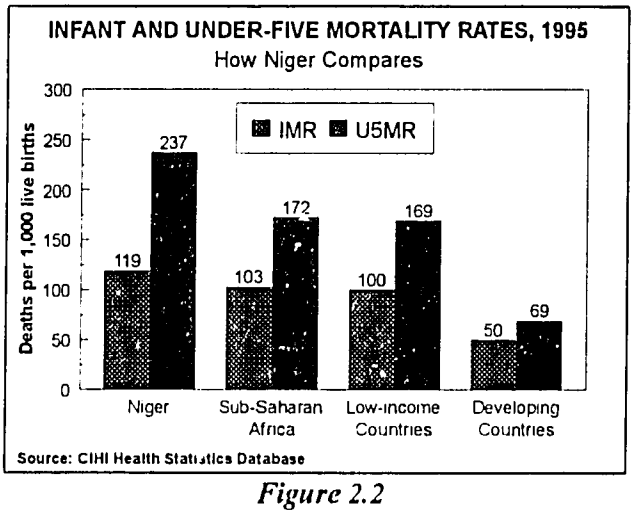



*Figure 2.2*

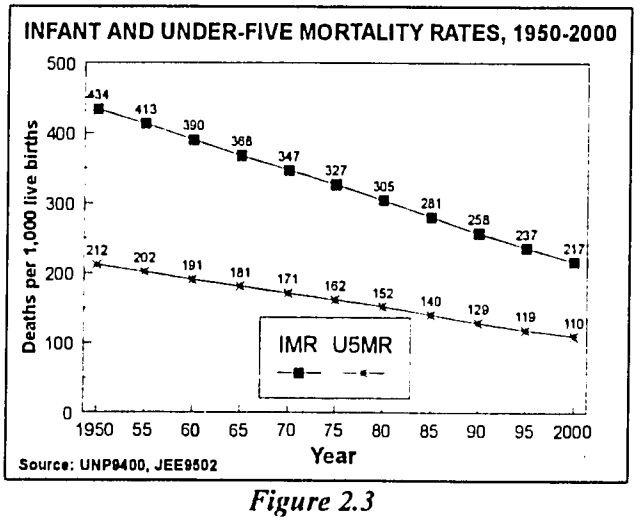



*Figure 2.3*

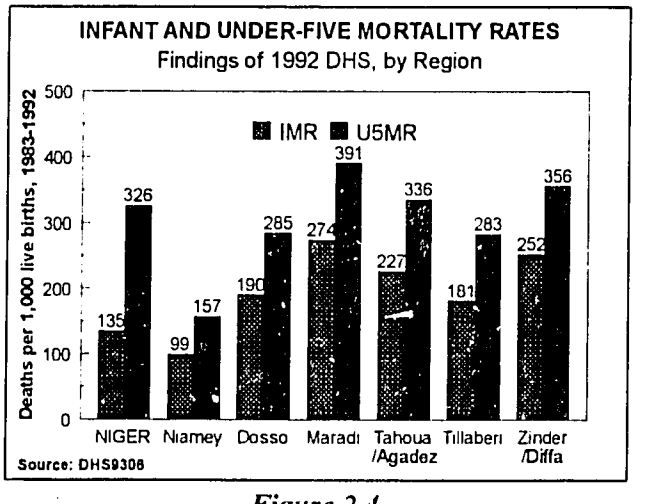



*Figure 2.4*

## Causes of Mortality & Morbidity

As is the case throughout sub-Saharan Africa, the vast majority of deaths and illness in Niger result from preventable diseases. The order of significance of different causes may fluctuate widely with the appearance and disappearance of devastating epidemic diseases such as meningitis. Malaria is always near the top of the list, along with respiratory infections and diarrheal diseases.

### Mortality

According to figures provided to the U.S. Centers for Disease Control (CDC), the most commonly reported causes of death among all age groups in 1986 were meningitis, malaria, and measles (see figure 2.5). Also significant were diarrheal diseases and pneumonia. The major reported causes of child mortality are fever presumptively diagnosed as malaria, measles, diarrhea, respiratory infections, and tetanus (VBC9002).

Tallies based on recorded deaths are subject to various biases inherent to sampling and reporting techniques. In Niger, only about ten percent of deaths are actually reported, so the statistics presented in figure 2.5 provide at best a very general glimpse of the true health situation in Niger. Unfortunately, more reliable health statistics and cause-specific mortality data are not available.

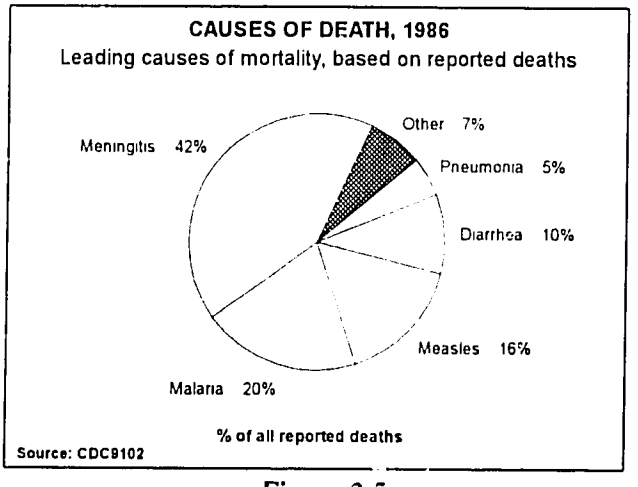



*Figure 2.5*

### Morbidity

National morbidity counts in Niger are largely based on reports from peripheral health services. Case reporting based on outpatient clinic visits for all age groups in 1984 and 1986 was dominated by malaria, diarrheal diseases, respiratory infections, and eye infections (see figure 2.6). The fifth most frequently reported condition, rhinopharyngitis, refers to inflammation of the nose and upper throat, which is associated with meningitis. Reports of wounds and injuries, abdominal pain, skin infections, and measles were also significant; other diagnoses comprised over one-third of the total (VBC9002).

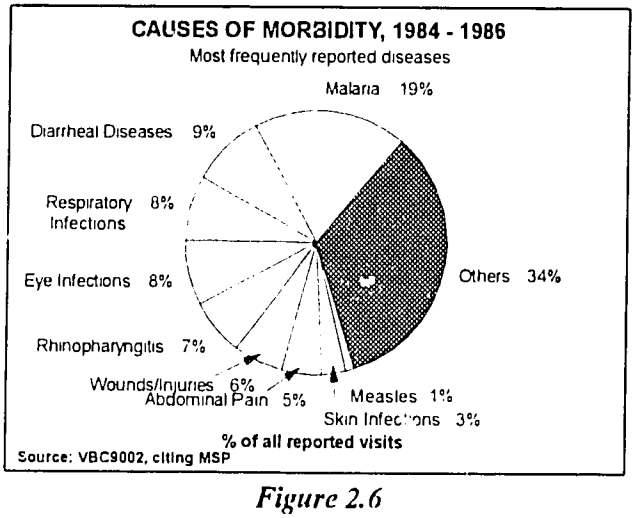



*Figure 2.6*

Disease reporting is incomplete and often lacks diagnostic specificity, except for the common diseases with easily-observed symptoms (measles, meningitis, poliomyelitis, tetanus, diarrhea, pneumonia, accidents, inflammatory eye diseases, and gonorrhea). In major towns where laboratory services are available, additional diagnostic specificity can provide information on such chronic infections as tuberculosis, leprosy, syphilis, schistosomiasis, and onchocerciasis (VBC9002).

More recent data on outpatient visits in Niger reinforce the 1984-86 trends in morbidity. As illustrated in figure 2.7, respiratory infections were the top reported cause of clinic visits in 1991 by children under the age of five, followed by presumed malaria, diarrhea, and eye infections. Also of significance were trauma, wounds, and burns, skin infections, and measles. Among persons 15 years of age and older, presumed malaria and respiratory infections were again at the top of the list of reported causes of outpatient visits in 1991. The third most frequently reported cause was trauma, wounds, and burns, followed by eye infections, skin infections, problems with bones and joints, and gynecological infections (see figure 2.8).

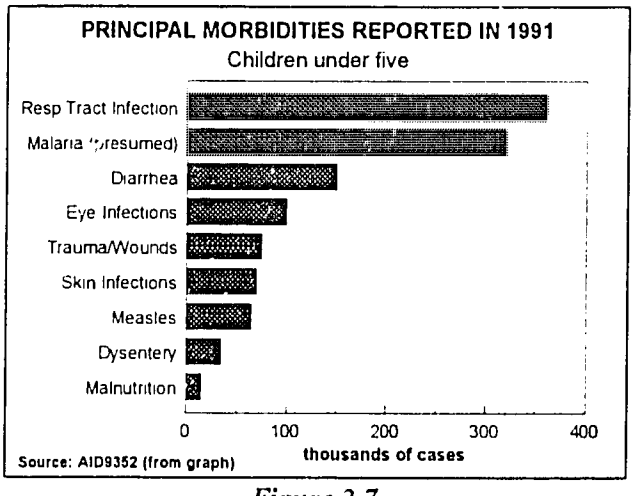



*Figure 2.7*

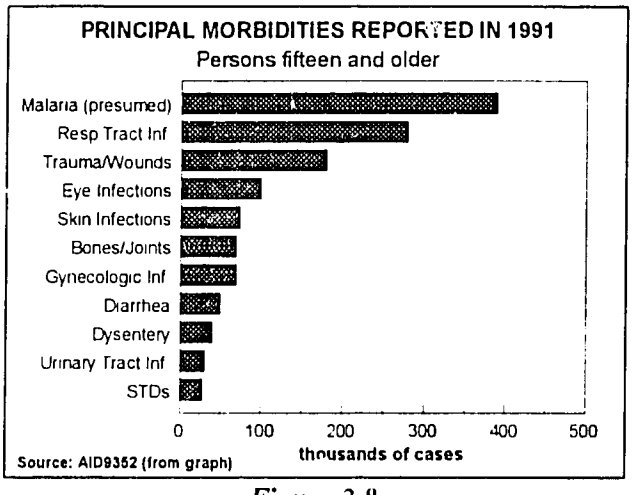



*Figure 2.8*

## Maternal Mortality

The 1992 DHS found a nationwide ratio of 652 maternal deaths per 100,000 births for the fourteen-year period preceding the survey. Among seven African countries with a DHS including data on maternal mortality, this rate places Niger at the top of the list, along with Guinea (DHS9412). Maternal mortality is very difficult to measure precisely and the methodology developed by DHS, which involves asking mothers about their sisters, is not without its own inherent faults. Citing the World Health Organization (WHO), UNDP's Human Development Report 1994 suggests a ratio of 850 for Niger, well above values reported for most other countries (see figure 2.9).

Niger's Ministry of Public Health (MSP), which reports a maternal mortality rate of 700 per 100,000 live births, cites the four leading causes of maternal mortality in urban areas between 1973 and 1988 as: hemmorhage at delivery (21 percent), rupture of the uterus (20 percent), infections (18 percent), and eclampsia (15 percent)(RON9401).

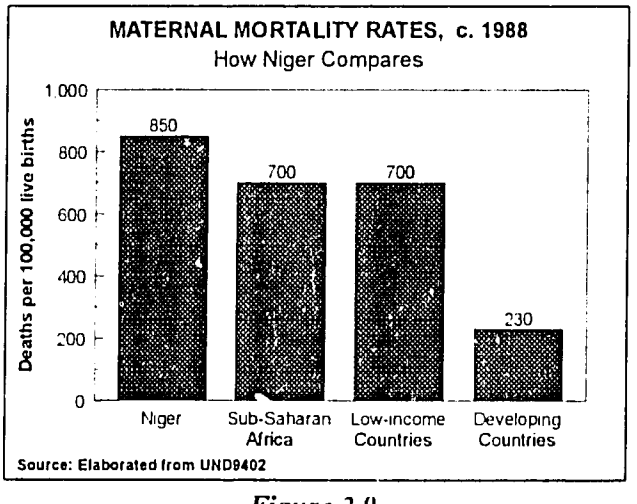



*Figure 2.9*

# Specific Health Problems

## Vector-Borne Diseases

Among Niger's greatest public health hazards are several diseases carried by mosquitos and flies. In Niger, as throughout sub-Saharan Africa, malaria is by far the most devastating. Niger has had success in reducing incidence of other vector-borne diseases, such as yellow fever and river blindness, to insignificance, but both of these diseases could conceivably return to threaten the population again. Another common vector-borne disease, schistosomiasis, is discussed later with diseases related to water and sanitation.

**Malaria.** Malaria is one of the most important public health problems facing Niger. According to the statistics presented above in figures 2.6 and 2.7, malaria is the leading cause of morbidity and the second most commonly reported cause of mortality, accounting for roughly 20 percent of each. In the latter half of the 1980s, total annual reported conditions of malaria ranged between 517,000 and 726,900. Although not all of these reports were actually cases of malaria, the true annual incidence of malaria was probably much higher considering the gross underreporting from areas not covered by government health services. Young children and pregnant women are the groups most vulnerable to the dangers of malaria (VBC9002).

In most of the country, malaria transmission is strongly seasonal. Incidence practically triples during the rainy season (between July and September) but falls to virtual insignificance during the dry season in large areas of the country. The most common form of malaria found in Niger is *Plasmodium falciparum*, which accounts for 90 to 95 percent of all cases. Other varieties found in Niger include *P. malariae* (2-8 percent), *P. ovale* (one percent), and an insignificant number of *P. vivax* cases (CDC9102). Chloroquine-resistant *P. falciparum* first spread to Niger in 1987-88 (VBC8801). It is thought that frequent travel to more highly endemic coastal zones where drug resistance is higher may also increase transmission in Niger (AID9352). Man-made environmental changes have adversely affected efforts to control malaria by providing breeding sites for mosquitos near human habitations. These include large areas of irrigated rice fields and the many deep borrow pits and pools dug to meet the growing demand for mud bricks to build new houses in rapidly growing urban communities (VBC9002).

An assessment by USAID's Vector Biology and Control (VBC) project found that Niger has three distinct zones of endemicity (see figure 2.10). The southern savanna areas, where about 57 percent of the national population resides, make up the "southern hyper-endemic zone." Here, parasitemia rates in children are generally above 80 percent during the rainy season, when malaria transmission is at its peak. The highest malaria incidence in the country occurs in this zone along the banks of the Niger River. To the east, the Sahelian area is referred to as the "northern hyper-endemic zone," where parasite rates among children ages 2-9 range between 66 and 93 percent. This zone is home to about 38 percent of the national population. Prevalence rates among infants and adults are about 20 and 25 percent, respectively. Finally, in the northern desert, the meso- to hypo-endemic zone exhibits an average parasite prevalence rate of 27 percent in children ages two through nine and ten percent among adults. Transmission of malaria in this zone is confined to a very short rainy season. However, nomads from this area frequently become infected during their migration to the south in the dry season (VBC9002).

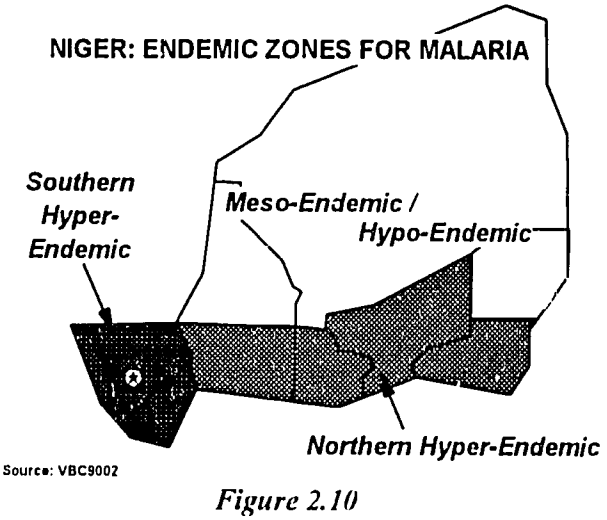



*Figure 2.10*

The 1992 DHS sought information on malaria by asking mothers if their children had had a fever in the preceding two weeks. Fever prevalence was found to be nearly twice as high in rural areas (48.7 percent) than urban (27.1 percent). Figure 2.11 indicates two-week prevalence rates found by the DHS by region.

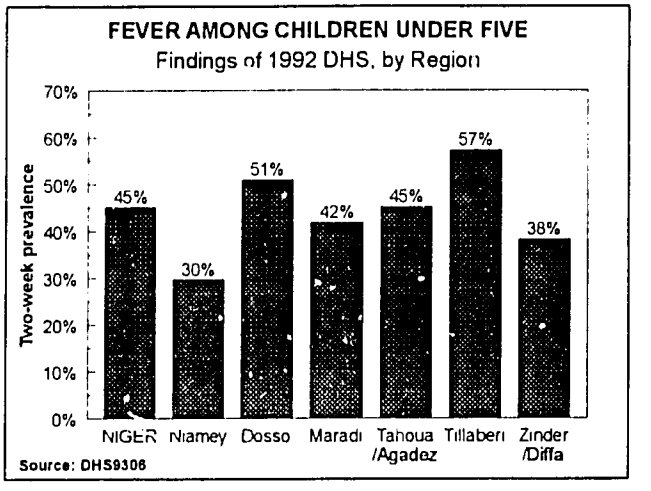



*Figure 2.11*

Niger's malarial control program focusses on treatment of all cases presumptively diagnosed as malaria at the place of the patient's first encounter with a health service or voluntary village health worker. This control measure is combined with chemoprophylaxis of high risk groups (VBC9002). A recent assessment of malaria treatment in Niger found that chloroquine is typically prescribed in insufficient doses, injectable quinine is overused, and the duration of treatment is usually too short (AID9418). Preventive measures in Niger are even less sufficient. The application of insecticides for malaria control is only practiced in the large towns and in a haphazard fashion. The use of bed nets and insect repellents for personal protection is not widespread and plays no major role in malaria control (VBC9002).

**Onchocerciasis (River Blindness).** Onchocerciasis is a chronic but non-fatal eye disease transmitted to humans by blackflies, which breed in fast-flowing rivers. In the mid-1970s, it was estimated that Niger had 15,000 persons severely infected with the parasite which causes the disease *(Onchocerca volvulus)* and 150,000 at risk of infection. Today, there is little evidence of any active onchocerciasis remaining in Niger. International efforts to eliminate "oncho" intensified in 1974, when seven countries in West Africa, including Niger, joined forces to fight the disease with financial support from 19 countries and institutions. The resulting effort, known as the Onchocerciasis Control Program in West Africa (OCP), was sponsored by UNDP, FAO, and the World Bank, and executed by WHO (GPI9001). Efforts in the 1990s included a project implemented by Helen Keller International (HKI) with funding from USAID. In 1993, a total of only 25 cases were treated, including 14 new cases, all of which were imported into Niger from other countries (AID9417). In 1994, indigenous onchocerciasis was declared eradicated from Niger (AID9506). The challenge of keeping transmission rates near zero depends on follow-up prevention activities, especially the distribution of the drug ivermectin. Otherwise, according to calculations by the OCP, "oncho" will return to its original levels in about 25 years (AID9217).

**Sleeping Sickness (African Trypanosomiasis).** Sleeping sickness is a disease borne by tsetse flies which prohibits the use of large areas of central and eastern Africa. One variety of the disease known as *T.b. gambiense* occurs in parts of West Africa as well. Although parts of the Niger River valley within Niger are considered endemic, the country has not reported any cases of the disease since the 1970s (VBC9101).

**Yellow Fever.** Southern Niger is part of Africa's endemic zone for yellow fever. Yellow fever virus in west Africa follows a sylvatic cycle involving non-human primates and mosquitos. Unimmunized humans may become infected when they are fed upon by infected mosquitos, a mode of transmission which typically occurs in rural environments. Studies have shown that cases and deaths in Africa are underreported by 10 to 500 percent. No cases have been reported in Niger in the past several years, but yellow fever continues to be a major threat in all endemic zones because it can reappear even after long periods of quiescence (WHO9503). Many African countries have abandoned expensive immunization programs for the far less effective strategy of emergency control during outbreaks. The Government of Niger includes Yellow Fever vaccine within its standard program for childhood immunization. The 1992 DHS found that 22 percent of one-year-olds had been vaccinated against yellow fever, including over fifty percent of urban children but only 16 percent of those in rural areas (DHS9306).

## Acute Respiratory Infections (ARIs)

ARIs are among the leading causes of morbidity and mortality in Niger and are the number one cause of illness among children under five. According to the report by CDC, the annual incidence of reported cases is 452 per 10,000 population (CDC9102). Respiratory infections, including pneumonia and measles, accounted for nearly ten percent of reported cases of illness in 1984 and 1986 and about 20 percent of reported deaths in 1986 (see figures 2.5 and 2.6 above). Among the various respiratory infections, bronchitis is the top cause of death in newborns, while pneumonia is the most frequent cause of deaths in two- to five-year-olds. The case fatality rate for ARIs in hospitals is around 19 percent in children under five years, according to a recent report by USAID's BASICS project (AID9417).

Incidence of respiratory infections is generally inversely related to age, peaking at four to nine infections in each of the first two years of life, dropping to three to four by school age, and remaining at two to three per year for adults. Incidence is highest at the onset of the dry season in March and April (AID9214). Measles primarily affects children and is easily preventable through immunization (more on measles appears under vaccine-preventable diseases). Pneumonia, a serious and potentially fatal lower respiratory infection, most frequently afflicts the very young and the very old (OUP9301).

To obtain information on the prevalence of respiratory infections among children in Niger, the 1992 DHS asked mothers whether each of their children had had a cough with short and rapid breathing in the two weeks preceding the survey. Overall prevalence was found to be 11 percent. Like other DHS surveys conducted in sub-Saharan Africa, the Niger DHS found prevalence to be slightly higher in rural areas (11.5 percent) over urban (7.0 percent) and highest among children under two years of age. As indicated in figure 2.12, the only regions which exhibited a prevalence higher than the national rate are the densely populated departments of Tillaberi and Dossa (DHS9306).

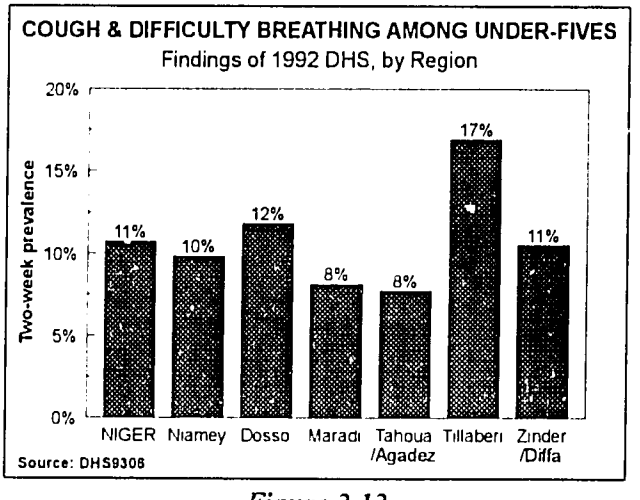



*Figure 2.12*

In the past, no particular attention was paid to this group of diseases and little had been done to reduce the impact of the problem in Niger. In part, this was due to the difficulty of defining an effective approach to the problem. In one of the first major efforts to control ARIs in Niger, WHO developed a set of criteria for the diagnosis and treatment of respiratory infections at the village worker level until a long-term preventive strategy could be developed (CDC9102). ARIs are now the concentration of the health ministry's newest vertical program. According to a recent evaluation contracted by USAID, case management of ARIs in Niger excessively relies on injectable antibiotics, cough syrups, and nasal drops. Antibiotics prescribed were found to be useless in nearly half of all cases (49 percent) and correct case management was found to have occurred in only 12 percent of all cases among children under five years of age. Mothers typically wait at least three days before consulting health services and 19 percent of cases arrive as severe pneumonia (AID9418).

## Airborne Diseases

Most of the common airborne diseases in Niger – tuberculosis, measles, pertussis, and diphtheria – are preventable through routine immunizations and are discussed below under vaccine-preventable diseases. Meningococcal meningitis, however, is a notable exception which is far more difficult to prevent.

**Meningitis.** Niger lies within a large, primarily Sahelian belt of Africa where epidemic outbreaks of meningococcal meningitis are frequent. Meningitis is inflammation of the *meninges*, the membranes that cover the brain and spinal cord. Acute bacterial meningitis is the most common type and occurs throughout the world, with higher incidence in many tropical countries. The disease is spread by airborne bacteria that attack the brain and spinal cord. Infection usually enters the body through the respiratory tract and reaches the brain through the bloodstream. It can afflict any age group, but most commonly occurs in the first few years of life (ARN8501).

Meningitis is common in the dry season on the fringes of the Sahara Desert but largely disappears when the rainy season begins. A massive outbreak in 1991 resulted in a total of more than 100,000 cases. Another deadly epidemic struck Niger in the the first half of 1995, producing a total of 26,736 cases reported and nearly 2,500 deaths through mid-April 1995 (WAP9501).

The 1995 outbreak started in the southern regions of the country in mid-November 1994. The weekly number of cases grew steadily from 39 in the week ending November 20, 1994, to 1,444 in the last week of February 1995 and grew increasingly higher through March. The number of deaths followed a similar pattern and the case-fatality rate fluctuated around ten percent, ranging by region from eight to seventeen percent (in regions with more than 100 cases) and by week from three to eighteen percent (WHO9506, RON9501). As illustrated in figure 2.13, the highest cumulative incidence rates through March 20 occured in the departments of Tahoua, which accounted for nearly one-third of total cases reported, and Maradi (22 percent of total cases reported). The city of Niamey also had an exceptionally high incidence rate, probably due to its concentration of health care facilities and consequentially increased levels of reporting. Among age groups, incidence rates reported from hospitals in Niamey and Dosso were highest among children ages five through fourteen and children ages one through four and lowest among persons older than 25 years and infants (RON9501).

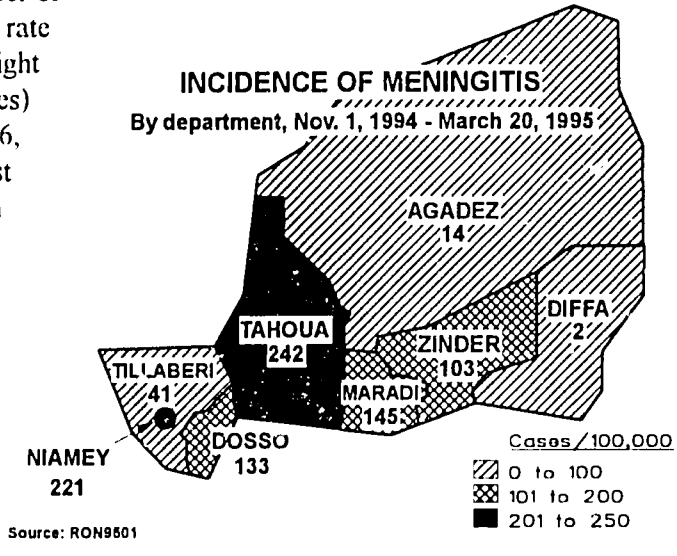


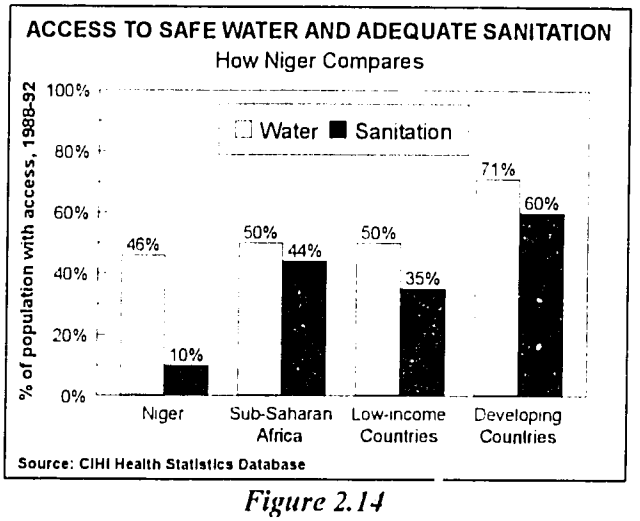

*Figure 2.13*

In April 1995, the MSP reported that the infection rate appeared to be slowing and the weekly death toll had diminished from more than 350 people in the first week of April to 150 in the second week (WAP9501). The decline of the epidemic was due both to natural seasonal variation and to a massive vaccination campaign conducted with the assistance of USAID, French Cooperation, Medecins sans Frontieres (MSF)/Belgium, CARE International, and UNICEF (RON9501).

## Diseases Related to Water and Sanitation

A great deal of death and suffering in Niger could be prevented through improvements in water supply and sanitation. The most common illnesses related to poor water and sanitation – diarrheal diseases – are responsible for a high proportion of deaths among children in particular. A host of other conditions, such as worm infections, skin diseases, and some eye diseases, greatly affect the health of children and adults as well. Together, these illnesses accounted for about 20 percent of reported causes of outpatient visits in 1984-86 (see figure 2.6 above).

Less than half of the population of Niger is thought to have reasonable access to safe water and only ten percent has access to adequate sanitation measures, according to a study by USAID's Water and Sanitation for Health (WASH) project. Both figures are well below median reported levels among sub-Saharan nations, low-income nations, and developing nations in general (see figure 2.14). As indicated in figure 2.16, only three percent of rural households were thought to have adequate sanitation measures in 1988, the second-lowest figure reported for any African country. The 1992 DHS found that 95 percent of rural households and 84 percent of all households lacked any kind of toilet or adequate latrine facility (DHS9306).

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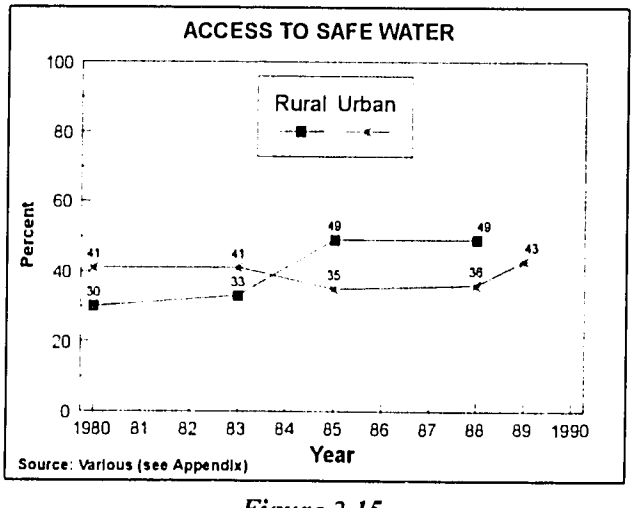


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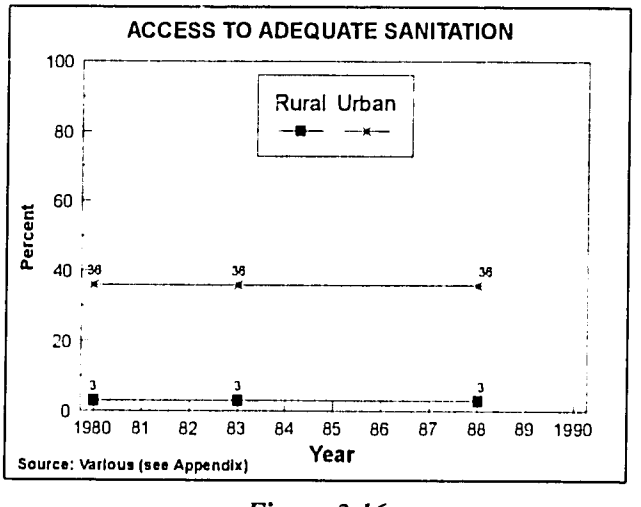



*Figure 2.16*

**Diarrheal Diseases.** According to a recent assessment by USAID, diarrhea is associated with 25 percent of illnesses in Niger and is the fourth highest cause of death among children. According to reports by Nigerienne mothers, 18 percent of child deaths are due to diarrhea (AID9417). The WHO reports that a 1992 survey found that children in Niger suffer an average of 7.2 episodes of diarrhea each year, one of the three highest incidence rates reported by WHO for African nations and well above the median of 4.5 episodes among sub-Saharan nations for which WHO has reported survey results (WHD9300). A 1991 study supported by the PRITECH project found that six percent of diarrheal episodes in Niger are persistent diarrhea, which is most common in malnourished children and infants aged 7-24 months (AID9417).

Diarrheal diseases are most common among children at the time of weaning and as children start to become more mobile. The 1992 DHS found two-week prevalence for diarrhea among under-fives at 28 percent, with the highest rates (over 40 percent) found among children aged 6-23 months. Over one-quarter of the children with diarrhea (7.3 percent of the total) had experienced bloody stools, indicating dysentery, in the two-week period and over half (15.5 percent of the total) had had diarrhea in the previous 24 hours. Two-week prevalence was found to be nearly 30 percent in rural areas but just over 20 percent in urban areas. Regional differences found by the DHS were not very marked with the exception of the capital, Niamey, where diarrhea prevalence was only 17.2 percent (see figure 2.17). Prevalence for dysentery was highest in Dosso (10.2 percent) and Maradi (8.9 percent) and only 1.8 percent in Niamey (DHS9306).

The 1992 DHS found that just 16.7 percent of children with diarrhea received oral rehydration therapy (ORT), one of the lowest ORT use levels in sub-Saharan Africa and well below the findings of earlier surveys in Niger (see figures 2.18 and 2.19). As illustrated in figure 2.20, ORS packets and home solutions are most frequently used to treat children's diarrhea in Niamey. In other departments, such as Maradi and Dosso, increasing liquids was the most commonly reported method of treating diarrhea among children (DHS9306).

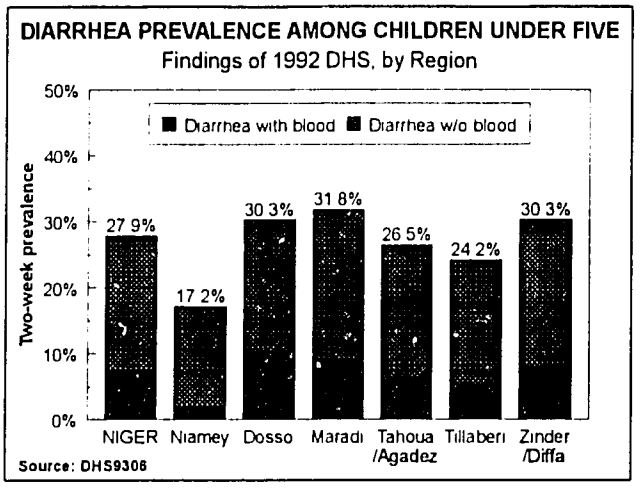
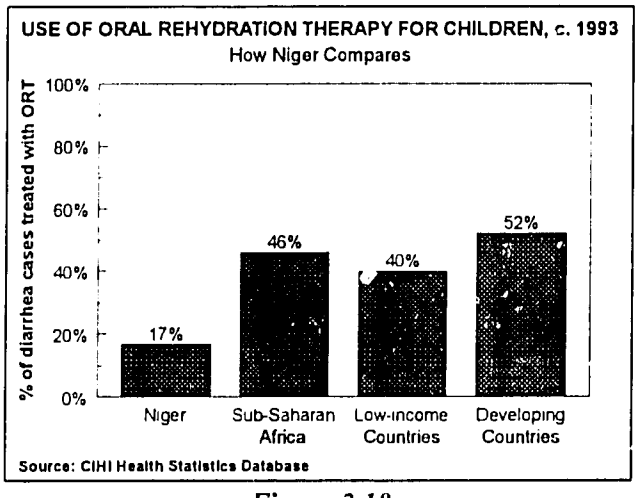



*Figure 2.17*

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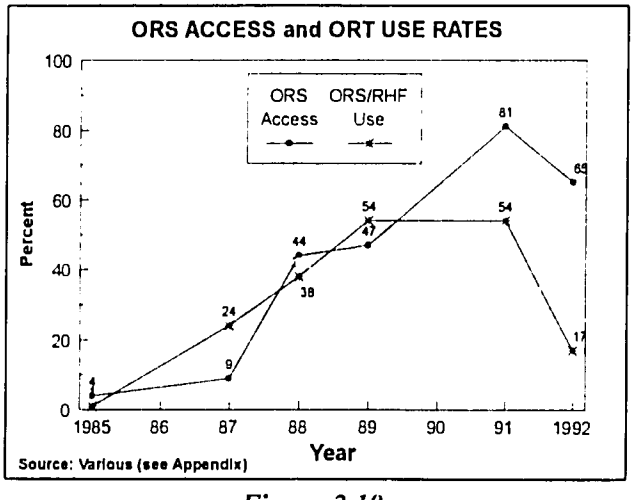


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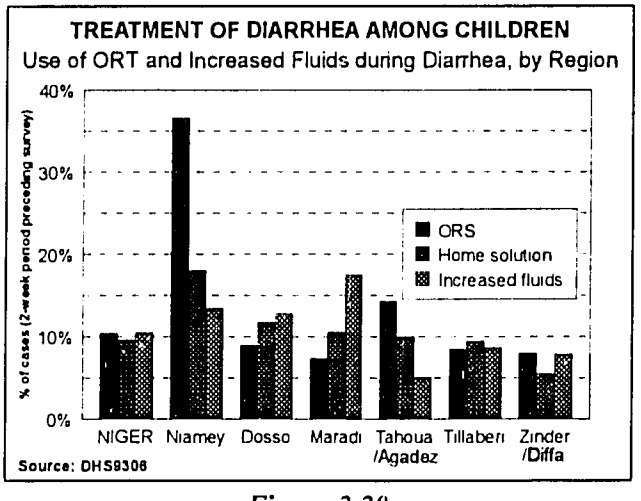


*Figure 2.20*

**Cholera**. Since the 1970s, cholera has appeared sporadically in Niger. After the most recent epidemic hit in 1991, a National Cholera Control Committee was formed (AID9417). In March 1995, WHO reported cholera to be present in Niamey and all of Niger's departments except Agadez (WHO9503). According to the MSP, the south of Maradi department, along the border with Nigeria, is the most affected area (RON9401).

**Helminth Infections.** Helminth infections include a wide variety of diseases caused by worms which contribute to malnutrition, anemia, and other health disorders. While many are treatable on a case-by-cases basis, the most effective strategy against helminths is prevention through improved water supply, sanitation and hygiene practices. Typical examples of helminth infections are ascaris, hookworms, and trichuris. Very little hard data exists on prevalence or incidence of most types of helminth infections, but Guinea Worm has been tracked closely as part of an international effort to eradicate the disease.

**Guinea Worm (dracunculiasis).** Dracunculiasis, also known as Guinea Worm disease, is a water-borne parasitic disease which until recently plagued millions of adults and children in rural Africa, India, and the Middle East. Niger is part of the core area of West Africa where dracunculiasis is endemic. In October and November 1991, national village-by-village searches detected 32,831 cases of dracunculiasis in 1,690 villages in five departments (see figure 2.21). Nearly two-thirds of these cases were found in Zinder department; of these, 85 percent were found in the arrondissement of Mirriah. No indigenous cases were found in a search of the two remaining departments, Diffa and Agadez (WHO9408). Niger ranked sixth worldwide in reported cases of Guinea Worm disease in 1992 and third in 1993 (25,346 cases) and 1994 (provisional total: 18,562 cases). By April 1995, the number of villages considered endemic had lowered to 866 (CDC9502).

Although Niger joined the campaign to eradicate dracunculiasis with fewer than three years remaining until the target date for eradication, it has been successful in rapidly establishing a Guinea Worm Eradication Program (GWEP). An early pilot project in Boubon, a village of 4,500 residents, had encouraging results, reducing incidence from an astounding 2,700 cases reported in 1991 to just 108 in 1993 (CDC9402). National interventions began with formation of a secretariat for the program in March 1993. That same month, the Carter Center's Global 2000 Program and the WHO Collaborating Center for Research, Training, and Eradication of Dracunculiasis at CDC assigned a resident public health advisor to provide direct assistance to the eradication effort (WHO9407).

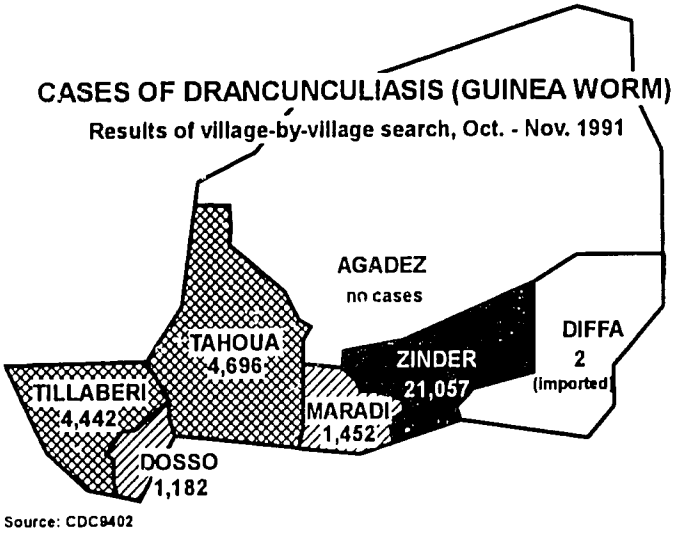


*Figure 2.21*

Implementation of the GWEP's interventions – health education, cloth filters, and improved supplies of safe drinking-water – though substantial will be insufficient alone to eradicate dracunculiasis before the original target date of December 1995. By December 1993, Niger's GWEP had initiated at least one intervention in 55 percent (928) of all villages with endemic dracunculiasis and had trained health workers for dracunculiasis eradication activities at national, regional, and district levels and in 298 villages (18 percent of the total) (WHO9407). By the end of 1994, GWEP reported trained health workers in 89 percent of endemic villages, health education activities in 92 percent, use of cloth filters in 52 percent, improved water supply in 75 percent, and vector control activities in ten percent (CDC9403).

To complete eradication of dracunculiasis, health officials have moved to implement more stringent measures for case containment and to apply *temephos* (better known under the brand name Abate) to kill the copepod intermediate host of the parasite in unsafe drinking-water sources of selected villages (WHO9407). The Japan International Cooperation Agency (JICA) has recently agreed to help provide safe drinking water in two of the most highly endemic arrondissements, Mirriah in Zinder department and Tera in Tillaberi department (CDC9503).

**Schistosomiasis (Bilharziasis).** *Schistosoma haematobium* is a blood fluke (trematode) infection acquired from water containing free-swimming worm larvae (*cercariae*) which develop in snails. The extensive irrigation schemes along the Niger River around Niamey in particular are foci of intense transmission of schistosomiasis. These areas exhibit prevalence rates of 40 to 70 percent (RON9401); in some areas all children of school age are infected. Up to 80 percent of infected children and over 60 percent of infected adults have disease of the genitourinary tract detectable by ultrasound. To the north, in some villages along the river near the border with Mali, the prevalence of urinary schistosomiasis is as high as 94 percent. A large undertaking in this area, Kandadji Dam, currently planned to provide irrigation for 100,000 hectares of land and produce about 360,000 Mwh of electricity per year, may provide additional habitat for the disease (WHO9307). Immediate effects of schistosomiasis infection, which include anemia and impaired cognition, can now be rapidly reversed through low-cost, single-dose oral therapy.

**Trachoma.** Trachoma is caused by repeated reinfection with *Chlamydia trachomatis*, an obligate intracellular bacterium. It is the major cause of blindness in Niger. Trachoma is hyperendemic in dry, dusty communities with poor sanitation and hygiene, where water is scarce and viewed as a precious resource. Transmission of infection occurs during contact with infected ocular or other secretions. Flies may act as physical vectors for transmission and a large fly population contributes to the risk of trachoma (GPI9001).

Trachoma is characterized by acute, inflammatory response to a series of infections through childhood, followed by evidence of scarring of the sub-conjuctiva. By late childhood and early adulthood, the scarring may be prominent and obscure evidence of active disease. Visual impairment and blindness from corneal scarring most often occur in middle age. Typically, patients with trachoma do not complain of symptoms until the scarring is significant enough to cause *trichiasis*, or inturned eyelashes. The community pool of active inflammatory trachoma resides in pre-school children; rates of active disease decline rapidly after age ten, with mothers or caretakers of pre-school children being the primary group of adults with active trachoma. *Trichiasis* and *entropion* can occur in young adults, but are typically seen in middle aged or older adults (WHO8902).

**NIGER: REPORTED ANNUAL INCIDENCE OF VACCINE-PREVENTABLE DISEASES**

| Disease | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| Measles | 22,932 | 20,463 | 90,071 | 31,341 | 37,051 | 47,591 |
| Tuberculosis | 608 | 5,200 | - | - | 626 | - |
| Pertussis | 4,284 | 3,102 | 671 | - | - | - |
| Tetanus (total) | 230 | 220 | 105 | - | - | - |
| Neonatal Tetanus | - | 39 | 74 | 56 | 46 | 26 |
| Diphtheria | 75 | 102 | - | - | - | - |
| Poliomyelitis | 19 | 32 | 57 | 40 | 41 | 58 |

Source: WHO9502, Reported Cases as of April 6, 1995

*Table 2.1*

## Vaccine-Preventable Diseases

Vaccine-preventable diseases, particularly measles, accounted for at least 16 percent of reported deaths in 1986. Although they hardly appear under the morbidity listing, their share as a contributor to illness among children and adults is very significant. Case totals of these diseases reported to the WHO's Global Programme for Vaccines between 1989 and 1994, presented in table 2.1 on the preceding page, are more an indication of how little we know about actual incidence, for complete annual reporting occurred for only two of the six diseases, measles and polio. Rises and falls in these figures may better reflect variations in reporting than actual changes in disease incidence.

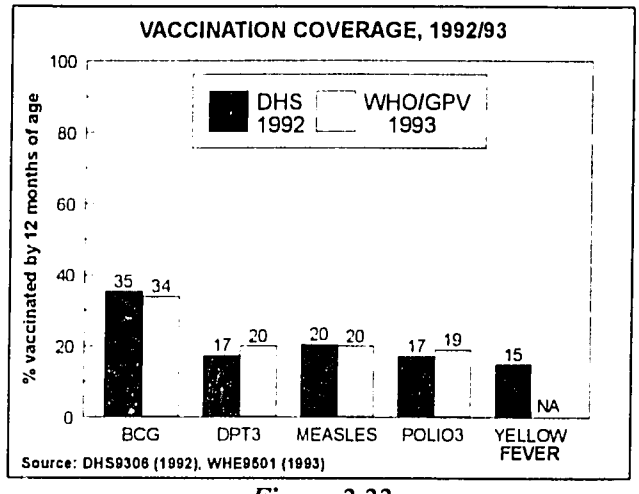


*Figure 2.22*

Reports by the WHO and mothers' responses to the 1992 DHS indicate that vaccination coverage by age one still does not exceed twenty percent for each of the five major childhood vaccines except BCG, for which reported coverage is 34 to 35 percent (see figure 2.22). Complete immunization coverage (not including yellow fever vaccine) by the first birthday stands at about 13 percent, according to the DHS. Among one-year-olds, the DHS found complete coverage at 17.4 percent nationwide but just 9.6 percent in rural areas (DHS9306). These rates are among the lowest in all of Africa and the developing world as a whole. Figure 2.23 compares current levels of immunization against diphtheria, pertussis, and tetanus (DPT3) in Niger with median values reported for sub-Saharan African nations, low-income nations, and all developing countries: Niger's DPT coverage level of 20 percent stands well below half of the median for sub-Saharan nations.

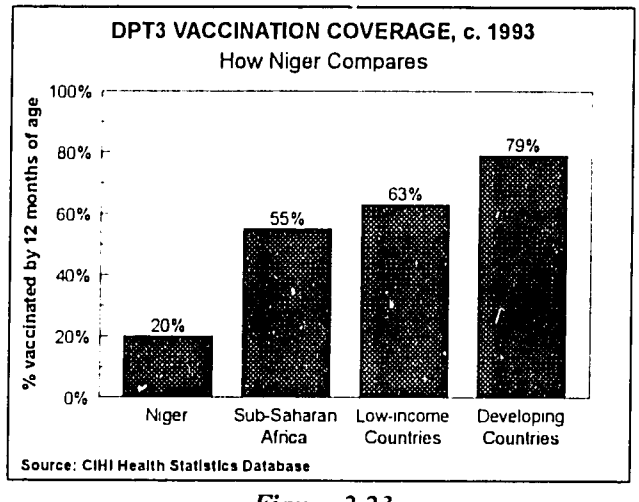


*Figure 2.23*

One of the greatest public health challenges in Niger is to provide basic health care coverage for people inhabiting sparsely populated areas or living as nomads. Having long depended on mobile immunization teams, in 1989 the MSP's Expanded Program of Immunization (EPI) changed to a strategy of fixed service delivery points supported by substantial outreach to cover these more isolated population groups (AID9216). Great variations in coverage levels according to geographic location have persisted. The 1992 DHS found that children in urban areas enjoy vaccination coverage levels three to six times higher than children in rural areas. Figure 2.24 indicates that rates in the capital are exceptional but that more sparsely populated departments lag far behind. Recent efforts to expand EPI coverage have been stymied by prolonged strikes and shortages of bottled gas from Nigeria, which is pivotal in maintaining the cold chain (AID9506).

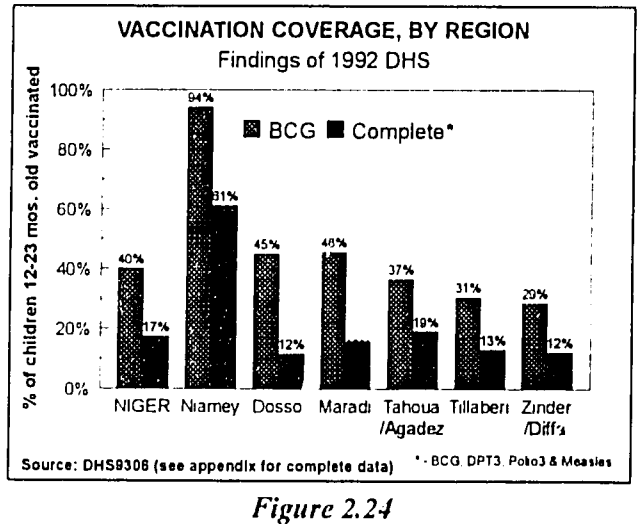


*Figure 2.24*

**Measles.** Measles, a highly communicable viral disease, has its most severe impact in infants and malnourished children. The WHO estimates that roughly six percent of measles cases in Niger are fatal (WHO9103). While the impact of non-fatal measles infection is not very well understood, long-term disabilities known to follow measles infection include blindness and malnutrition (OUP9301). Annual reported incidence of measles in Niger for the years 1989-1994 appears in table 2.1. For most years, about 20-30,000 cases of measles are reported, but in 1991, reported cases hit an astounding high of over 90,000 for the year (WHO9502). Levels of coverage against measles remain abysmally low at about 20 percent (see figure 2.25).

Measles is a major problem in rural and urban areas alike. After a serological survey was conducted among Tuareg nomads to determine their level of immunity to measles, more than half (57.9 percent) of the children under 10 years were not found to have detectable antibodies to measles, suggesting that transmission of the disease is low in this mobile population. Nomads are a reservoir of susceptible individuals who require immunization strategies adapted to their particular lifestyles (WHO9202).

In urban areas, antibody prevalence may be higher, but so are the chances of contact with the virus. The dangers of an urban measles epidemic, particularly in the presence of large numbers of unexposed and unvaccinated migrants, became apparent during the nationwide epidemic of 1990-91. According to a recent journal article, from October 1990 to April 1991, over 13,500 cases of measles were reported in Niamey alone. Vaccine coverage rates in Niamey before the epidemic were 63 percent at the age of 12 months and 73 percent at 24 months. Nearly one-quarter (22 percent) of the cases occurred among infants (children less than one year old) and the highest incidence rate was among children ages 6 to 8 months. The risk of transmission of illness increased with the intensity of contact with a case. Seasonal migrants in Niamey were also found to be more likely to develop measles (PID9401).

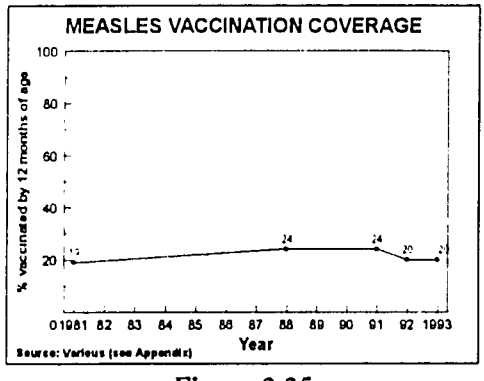


*Figure 2.25*

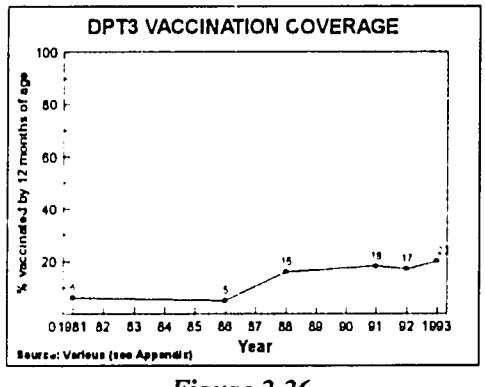


*Figure 2.26*

**Diphtheria.** The epidemiology of diphtheria in the developing world is poorly understood. Although the causative organism is widely present in Africa, there are few reported cases of this childhood disease. Coverage rates for the DPT vaccine have been minimal in Niger (see figure 2.26), but only 75 cases of diphtheria were reported to WHO in 1989 and 102 in 1990. These numbers, and the lack of more recent data, are reflective of the poor state of development of diagnostic and health information systems in Niger.

**Pertussis.** The majority of cases of the pertussis syndrome, better known as whooping cough, are infections preventable through the DPT vaccine. Although pertussis occurs endemically, it tends to produce epidemics every three to four years, with up to 90 percent of those at risk developing the disease. Incidence is generally higher among girls than boys. The case fatality rate for pertussis in African nations is typically about one percent, with the highest mortality observed among children under two (OUP9301).

**Tetanus.** Tetanus is a completely preventable disease caused by contamination of wounds with an anaerobic bacillus. Case totals reported to WHO vastly understate the actual incidence of tetanus and neonatal tetanus (NNT). NNT may be the most underreported lethal infection in the world, for its young victims are rarely registered or seen within the formal health care system. After measles, NNT kills more children around the world than any other vaccine-preventable disease, but routine disease surveillance systems in most developing countries

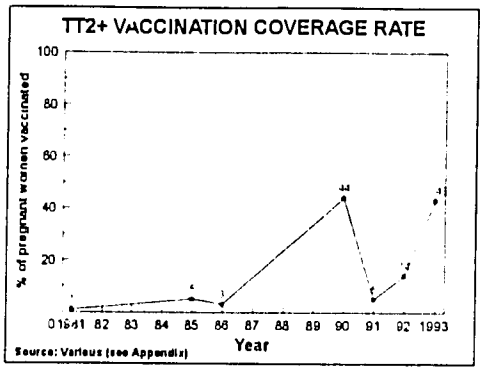


*Figure 2.27*

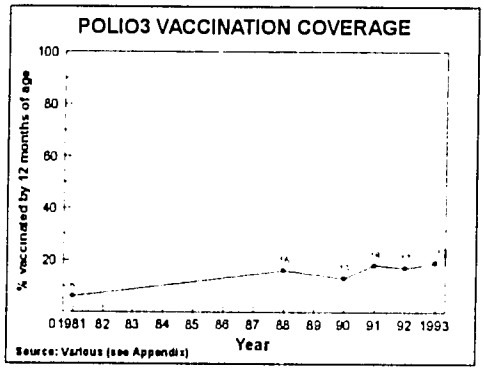


*Figure 2.28*

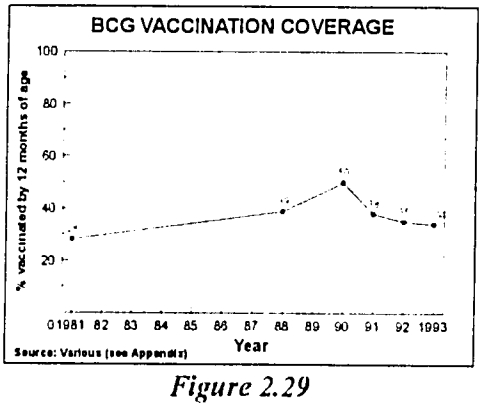


*Figure 2.29*

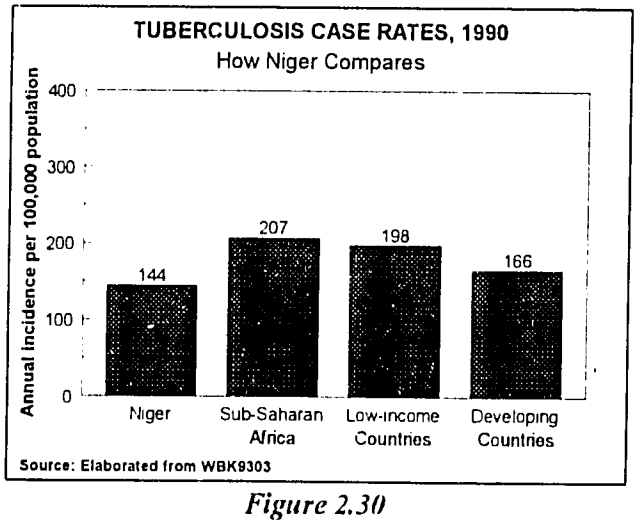


*Figure 2.30*

detect less than five percent of total cases, according to WHO. Tetanus is also a significant cause of preventable maternal mortality. In Niger, vaccination of pregnant women to prevent NNT only began to reach significant levels in the late 1980s (see figure 2.27). A survey of over 2,500 live births conducted in 1989 found that one-third of neonatal deaths were due to NNT, suggesting an NNT mortality rate of nine deaths per 1,000 live births (OUP9301).

**Polio**. Niger has made very limited progress toward the elimination of polio, reporting between forty and sixty new cases each year since 1991. As with other vaccines, coverage against polio in Niger remains just about the lowest in the world at just 19 percent (see figure 2.28). With over 80 percent of children still at risk to contract poliomyelitis in Niger, there is little chance the disease can be eradicated in West Africa any time in the near future.

**Tuberculosis** (TB). In the developing world, TB is generally concentrated in the adult age groups (OUP9301). As illustrated in figure 2.30, the annual incidence rate for TB estimated for Niger is well below median levels among African nations as well as developing nations in general. This is at least partly explainable by Niger's limited exposure to the HIV/AIDS pandemic, for TB has made a resurgence in areas where more susceptible AIDS victims can serve as reservoirs of the disease. Coverage rates among children for the BCG vaccine to prevent tuberculosis reportedly reached 50 percent in 1990 before quickly falling back bown to about one-third in 1992 and 1993 (see figure 2.29). Health information systems in Niger are too incomplete to provide more meaningful information on the actual incidence or mortality rate of TB. This situation is indicated by the sporadic reporting of annual cases to WHO in table 2.1, which provide a gross under-representation of the scope of the problem. It is estimated that there are about 4,000 new cases of tuberculosis in the country each year.

**Leprosy**. BCG has been shown to be partially effective in preventing leprosy as well. In mid-1995, WHO reported that Niger had 4,044 registered cases of leprosy. This represents a substantial decline from the 6,563 cases registered at the end of 1993, when WHO estimated actual cases at 10,000. That estimate was enough to qualify Niger as one of 25 major endemic countries in the world. The 1995 prevalence rate of 4.7 cases per 10,000 people is still ninth-highest among African countries. Multi-drug therapy (MDT) was introduced in 1983. Progress has been slow: in 1995, the number of cases being treated with MDT was 1,995, or 49 percent, the second-lowest level of coverage of any African country. A cumulative total of 2,895 leprosy patients had been cured through MDT by 1995, according to WHO (WHO9507,WHO9508).

## Nutritional Deficiencies

The interplay between malnutrition and disease is complex. Various forms of malnutrition are rampant in Niger and, combined with high disease incidence, greatly contribute to the country's high rates of infant and child mortality. Small birthweight babies due to maternal malnourishment and infant malnutrition during the weaning period are particularly grave problems in Niger (AID9417). The 1992 DHS found that 36 percent of children in Niger were malnourished as measured by weight for age and that 16 percent suffered wasting (low weight for height) (DHS9306). Both figures indicate prevalence of short-term malnutrition, which is particularly common during the rainy season (also the planting season), when malaria transmission is at its highest and physical labor requirements reach a peak (VBC9002).

Thirty-two percent of children were found by the DHS to suffer stunting (low height for age), which is evidence of long-term, chronic malnutrition. Figure 2.31 indicates that stunting was most prevalent in the eastern departments, ranging from 35 to 43 percent of children, and affected less than one quarter of children in Niamey, Dosso, and Tillaberi (DHS9306).

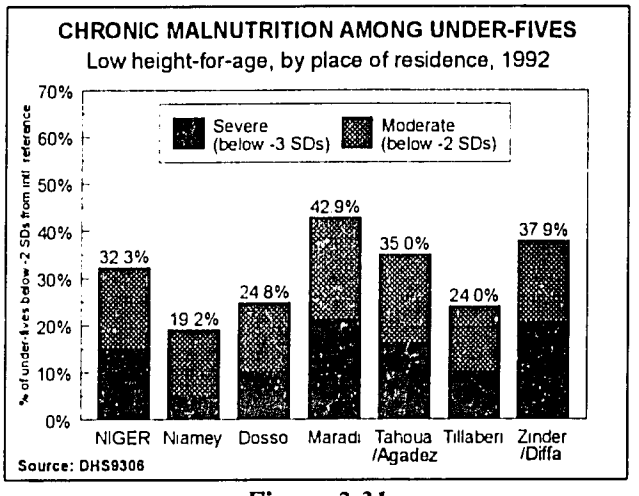


*Figure 2.31*

The various causes of malnutrition in Niger are poorly understood and may be attributed to many interrelated economic, social, and cultural factors. There is no doubt that acute food shortages play a role in the persistence of the disease-malnutrition cycle among Nigerienne children. Although the recent 1994 Human Development Report listed Niger's level of daily calorie supply at 98 percent of requirements for 1988-1990 (UND9402), another study of eating patterns in Niger indicated an average caloric intake well below minimum requirements by international standards, according to CDC. This substandard diet is reduced by another 10-15 percent during the dry season before the harvest (CDC9102). On the positive side, the 1992 DHS found a median duration of 20.9 months of breastffeeding for Nigerienne children, a considerably longer period than found by most other DHSs conducted in Africa (DHS9306).

At the household level, inadequate food supply can result from insufficient household income and poor agricultural production, which in turn is a product of poor soils, lack of adequate rainfall, and natural catastrophes such as drought or insects ravaging the harvest. Despite the high incidence and long duration of breastfeeding in Niger, early and inappropriate supplementation also contribute to the high prevalence of malnutrition. Other important factors include high levels of illiteracy and lack of knowledge among mothers concerning proper infant feeding, traditional eating patterns favoring the male members of the household, and diets deficient in protein-rich foods, vitamins A and C, iron, and iodine (CDC9102).

**Protein-Energy Malnutrition (PEM).** PEM results from two mutually-reinforcing causes: infectious diseases and insufficient intake of energy and protein. *Kwashiorkor* is a form of severe PEM occurring in early childhood, typically between the ages of one and three years. It is characterized by edema (excessive fluid in tissues) and failure to grow. The main cause in Niger seems to be a diet consisting mainly of bulky, staple foods and very low in protein, especially animal protein. Various infections may also assist in producing kwashiorkor, such as diarrheal diseases, intestinal worms, and respiratory infections, including tuberculosis and pertussis (whooping cough). These conditions increase the body's need for energy and nutrients and may affect appetite. *Marasmus* is a distinct form of severe PEM usually occurring in the first three years of life. The main cause is a diet severly lacking both in protein and calories. In contrast to kwashiorkor, children with marasmus tend to be under one year old and are visibly thin (ARN8501).

**Micronutrient Deficiencies.** People in virtually every developing country experience deficiencies in vitamin A, iodine, or iron that are large enough to constitute a public health problem. Unfortunately, the rise in caloric intake that accompanies economic development and higher income does not necessarily solve the problem of micronutrient malnutrition, for these nutrients are not present in all foods (some are present in very few), and people do not have a natural hunger for them. According to the World Bank, the major micronutrient deficiencies in Niger are vitamin A and iron deficiencies (WBK9405).

**Iron Deficiency (anemia).** Iron deficiency, when severe, can result in anemia, a shortage of iron in the blood which reduces physical productivity and children's learning capacity and, by reducing appetite, may diminish children's intake and growth. Malaria is also a major contributor to anemia. Women are particularly susceptible to anemia because menstruation and childbearing raise their need for iron; anemia among pregnant women increases the risk of death from hemorrhage in childbirth. According to estimates published in the World Development Report 1993, nearly half of pregnant women in Niger suffer anemia, a level typical for sub-Saharan Africa and developing countries in general (see figure 2.32).

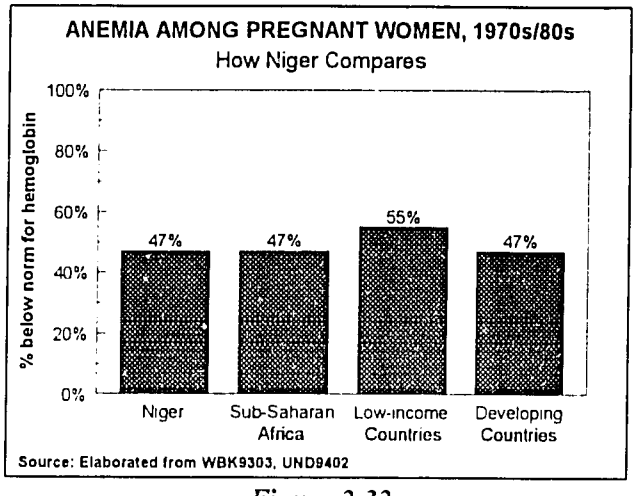


*Figure 2.32*

**Vitamin A Deficiency (VAD).** VAD is a major public health problem in Niger which frequently results in changes in the physiology of the eyes (xerophthalmia), resulting in blindness. Of 18 countries in Africa where VAD has been documented or is suspected to be significant, Niger is classified by the WHO as a "category 1" country, indicating the highest level of public health significance (AID9219). Tests among children around the country in 1986 and 1987 found that between one and four percent suffer "night blindness," which results from VAD. A survey in Tillaberi in 1990 found prevalence of signs of xeropthalmia at 4.3 percent among children under five years of age, well above limits established by WHO to monitor for the effects of VAD (AID9218).

**Iodine Deficiency (goiter).** In Africa, prevalence of iodine deficiency is generally higher in mountainous and flood-prone areas where iodine-deficient soils prevail. Women and children seem to be the most vulnerable to the serious and irreversible consequences of iodine deficiency (OUP9301). A recent USAID assessment reported that goiter is present in 25 percent of the population of Niger (AID9418). According to the MSP, the problem is most acute in the dapartments of Dosso, Tillaberi, and Maradi (RON9401).

## Sexually-Transmitted Diseases (STDs)

STDs ranked eleventh in overall morbidities reported in the 15 and over age group in 1991. In some departments STDs are of even greater significance, particularly Diffa, where they were the eighth most commonly reported cause of outpatient visits. The problem is not limited to adults, however, as eleven percent of STD cases reported nationwide in 1991 were in the 14 and under age group (AID9352).

**HIV/AIDS.** Both major strains of the human immuno-deficiency virus – HIV-1 and HIV-2 – are present in Niger, but the HIV/AIDS pandemic has not impacted the country nearly as hard as elsewhere in Africa. HIV seroprevalence levels among low-risk groups have not yet topped one percent in urban areas. Levels among higher-risk groups, however, have been found to exceed ten percent. Both levels are lower than those found in most of Niger's neighbors (see figure 2.33).

As of mid-1993, Niger had reported a total of 921 cases of AIDS to the WHO. In 1992, the last full year of reporting, Niger counted 304 new cases, producing an incidence rate of 4.0 cases per 100,000 population, roughly equivalent to rates in Mali (4.6), Chad (6.1), Senegal (4.2), and Benin (4.3) and well below those found in Burkina Faso (30.3) and Cote d'Ivoire (28.3)(WHO9501). Reported cases and incidence rates based on these reports inevitably underestimate the true scope of the disease. More information on HIV/AIDS in Niger and efforts to combat the epidemic appears in Section IV below.

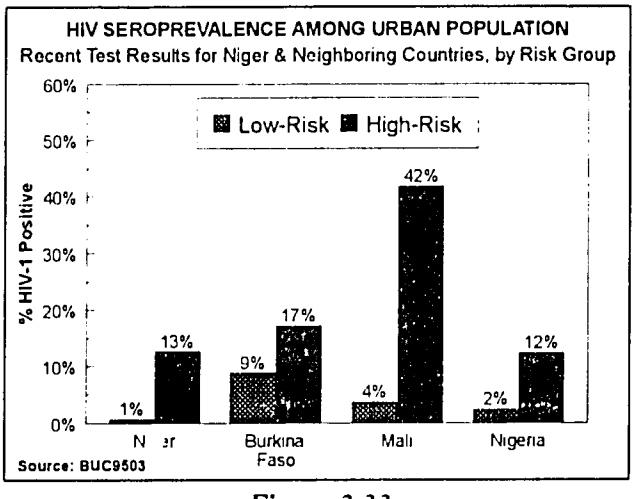


*Figure 2.33*

**Other STDs.** Recent testing results in Niger indicate fairly low prevalence levels for syphilis and gonorrhea among lower-risk groups (see figure 2.34). A study of 400 pregnant women in Niamey found 1.5 percent positive for gonorrhea and 4.0 percent positive for syphilis. Prevalence levels found among 253 prostitutes, however, were at about one-quarter for each disease (CAB9503). Another study in Tahoua in 1992 found evidence of a history of syphilis among 15.1 percent of pregnant women. Syphilis testing of another risk group, truck drivers, provides some evidence of that profession's role in the spread of STDs, for a smaller sample of international drivers was found to have a prevalence of 10.3 percent while samples of national and mixed-route drivers indicated prevalences of 7.9 and 6.6 percent, respectively (BUC9502).

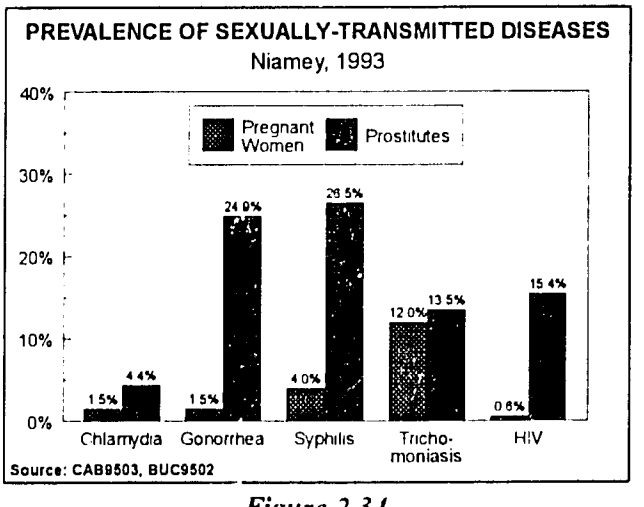


*Figure 2.34*

# III. HEALTH SECTOR ASSESSMENT

## Health Care Services

The national government provides the vast majority of modern health care in Niger, but practitioners of traditional medicine also comprise a major element of the health sector. One of the greatest challenges facing Nigerien health services is extension of basic health care to the country's nomadic and semi-nomadic population, about 15 percent of which is estimated to lack any kind of health care coverage (AID9214). Efforts to meet this challenge in the 1990s have been stifled by prolonged public sector strikes resulting in the complete shutdown of services in some areas (AID9506).

### Access and Utilization of Services

According to UNICEF, 68 percent of Niger's population lacks access to formal health services, including 70 percent of the rural population (UNI9501). The UNDP's Human Development Report 1994 reported a similar level of access, about half the median level for sub-Saharan nations (see figure 3.1). A 1991 assessment of Niger's health sector by consultants to USAID's PRITECH project concluded that possible methods of reaching the majority of rural residents had not been adequately pursued (AID9214).

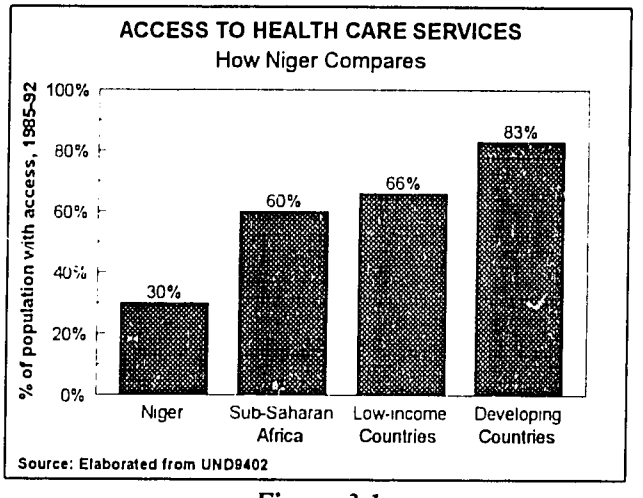


*Figure 3.1*

Based on data from Niger's National Health Information System (SNIS), total consultations per inhabitant are estimated at only 0.73 per year. The PRITECH assessment found that public health facilities were understaffed and subject to a high level of personnel turnover. Along with drug shortages, staffing problems were seen as partly to blame for low use rates among the rural population with access to health services: only 60 percent of rural residents who live within five kilometers of a health facility attend it for curative services (AID9214). Low use of child health services is indicated by the DHS's finding that only 32.1 percent of children nationwide had received their first dose of DPT vaccine at one year of age (DHS9306).

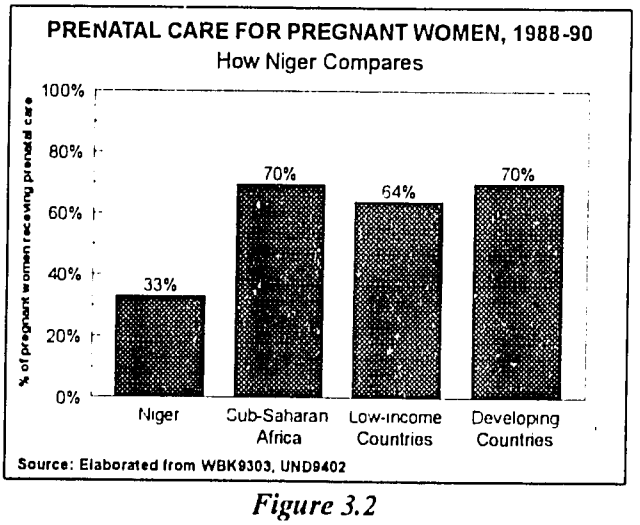


*Figure 3.2*

Figures 3.2 and 3.3 provide some indication of levels of service utilization by pregnant women in Niger. According to the Human Development Report, only one-third of pregnant women receive prenatal care in Niger, less than half the median level of 70 percent for sub-Saharan Africa and developing countries in general. This is comparable to DHS findings that just 30 percent of pregnant women received prenatal care from a doctor or nurse. The lowest levels were found in Zinder/Diffa (15.5 percent) and Maradi (22.2 percent); in rural areas as a whole, less than 20 percent of pregnancies received prenatal care. Meanwhile, 92 percent of pregnancies in Niamey received the attention of a doctor or nurse, according to mothers' responses to the DHS (DHS9306).

Although Niger's level of prenatal care is among the lowest ever recorded by a DHS, Niger's performance in birth attendance pales in comparison: the DHS findings of 15 percent of all births and just five percent of births in rural areas attended by a doctor or nurse are the lowest figures ever found by a DHS. Figure 3.3 indicates how the level of 15 percent compares to rates found elsewhere.

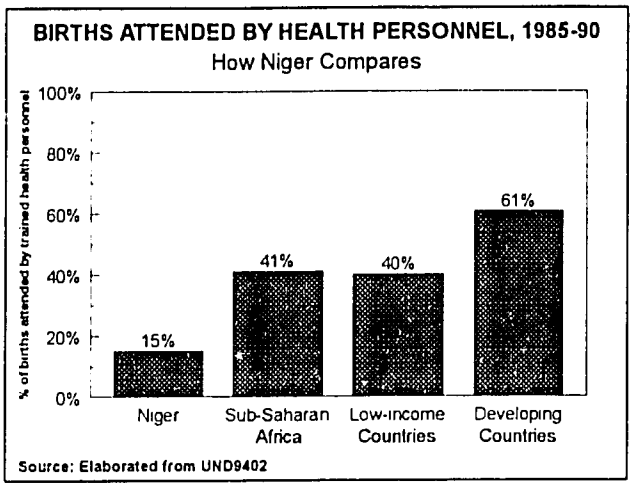


*Figure 3.3*

## Health Care Personnel

Niger has one of the world's most acute shortages of doctors, according to the World Bank. The nation's ratio of roughly three doctors per 100,000 population was on par with Tanzania, Chad, Ethiopia and Burkina Faso. Only four nations worldwide – Mozambique, Malawi, Rwanda, and Guinea – were reported to have lower ratios for the period 1988-92 (WBK9303).

Figure 3.5 details ratios of population per public sector health worker by department, as reported in a 1994 health ministry planning document. Although Tillaberi appears to have the greatest scarcity of nurses and doctors, it is the department surrounding Niamey, where ratios are by far the best in the country. Agadez and Diffa have the best personnel ratios after Niamey. Ratios for the other four departments are well above national-level ratios in all three categories (RON9401).

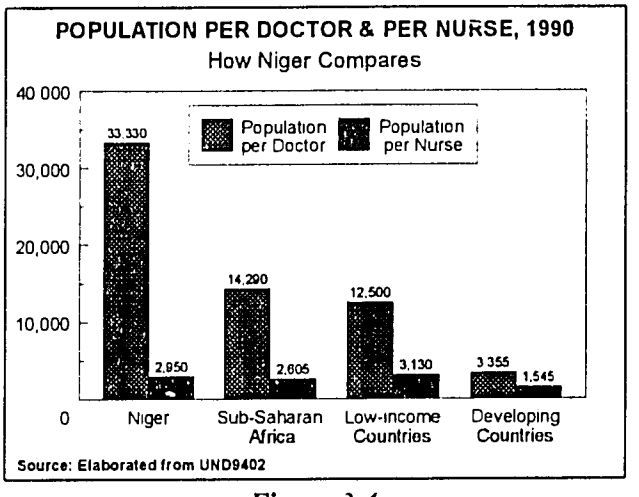


*Figure 3.4*

## Public Sector Services

Public health care is primarily the responsibility of the Ministry of Public Health (MSP). The government also relies heavily on military infrastructure to provide health care to the general public; the majority of patients treated at military health clinics are civilians with no connection to the military (CAB9402).

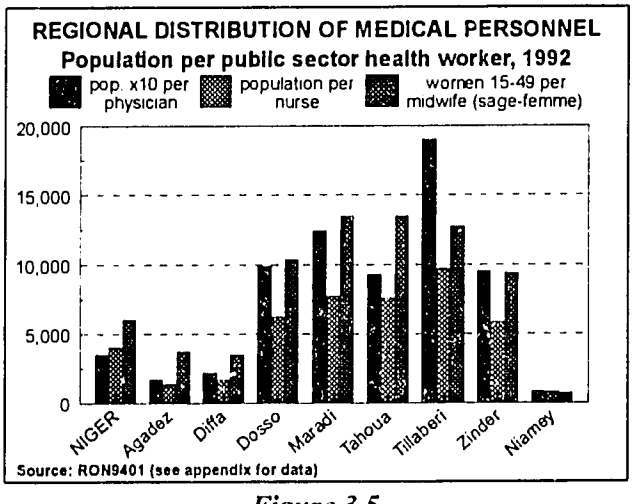


*Figure 3.5*

**Ministry of Public Health.** The MSP *(Ministère de la Santé Publique)* operates through seven departmental health divisions (DDSs), forty districts served by health centers (CMs), and 238 areas served by health posts *(postes medicales)*, dispensaries, mobile clinics, and village health teams (VHTs) (AID8904). Rural health districts are organized on three levels: rural dispensaries, which provide the first point of contact with the health system, medical posts, which act as intermediate referral centers, and the district hospital. Mobile teams concentrate on immunization services with some curative care, STD and leprosy control, and hygiene and sanitation promotion. While fixed facilities are often accessible only to the minute fraction of the population living nearby, mobile units have been criticized for providing only sporadic contact with the largely nomadic rural population (WHF9201).

**Facilities.** At the end of 1992, MSP facilities included three national reference hospitals (Lamordé, Niamey, and Zinder), five departmental hospitals, 39 health centers, 31 health posts, 67 maternal and child health centers, 86 maternities, and 242 rural or village *(quartier)* dispensaries. Niamey is the seat of two of the national hospitals, including the country's main reference hospital, Niamey National Hospital, as well as two major maternity centers, a national family health center, and specialized centers for leprosy and tuberculosis (RON9401). A 1992 study by the World Bank (using a more open definition of "health center") found that the number of health centers in Niger nearly doubled between 1980 and 1990 but was still grossly insufficient to provide health care for all Nigeriennes by the year 2000 (see figure 3.6)(WBK9401). The MSP has expressed the desire to improve and extend existing facilities, but is highly dependent on support from the donor community, which considers it overextended and tends to regard increasing utilization of existing facilities as the overriding priority (AID9214).

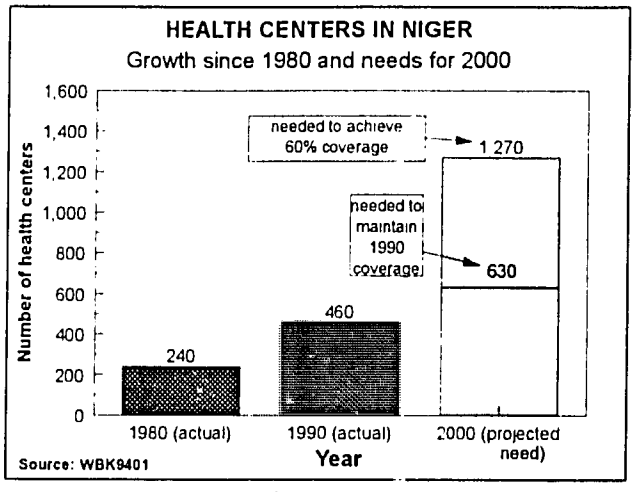


*Figure 3.6*

**Organization of Health Services.** The PRITECH assessment found that MSP facilities emphasize curative services generally at the expense of preventive care. Programs emphasizing child survival interventions – vaccination, malaria control, diarrheal disease control, family planning, and nutrition – are still underdeveloped and poorly integrated with standard health services, according to the consultants' assessment. These programs tend toward vertical organization, partly because donors typically desire to maintain control over the projects they fund. The assessment found that internal structural divisions hindered integration, particularly in the cases of family planning and vaccination. The MSP's Directorate of Family Planning (soon to be a "Division") and the recently separated Ministry of Social Affairs and the Promotion of Women *(MASPF)* share responsibility for the family planning program, which is reportedly making inroads, particularly in urban areas. Vaccination efforts are carried out by two distinct offices within the MSP, the Office of Hygiene and Mobile Medicine *(DHMM)* and the EPI *(PEV)* office. These configurations may be subject to reorganization as the National Conference considers reforms in the health system. Integrated nutrition efforts should improve with upcoming support from the World Bank (AID9214).

**Decentralization.** MSP services are theoretically decentralized to the department and district levels. The PRITECH consultants found that there is a degree of autonomy with some decentralized planning in the DDSs but that resources were still managed centrally. District medical officers were found to have little responsibility beyond supervision. Meanwhile, the MSP's Directorate of Studies and Planning (DEP) was found to be ineffective as a planning and coordinating body partly because it lacks any real power over other health directorates, which are located at the same organizational level (AID9214).

**Village Health Teams (VHTs).** Niger started using village health workers as rural extension agents as early as 1964, training "public health workers-hygienists" (presently known as *secouristes*) to promote vaccination efforts, provide basic health and hygiene education, give simple care, and refer cases beyond their skills to health facilities. In 1966, the MSP started training similar maternal care providers known as *matrones*, most of whom had been traditional birth attendants. While Niger's VHTs may have been a pioneering model in previous decades, a 1988 evaluation by USAID's PRICOR project found that the program lacked necessary central and provincial support and relied solely on donors for training and supervision. Gaining support from administrative and traditional leaders had been key to the program's foundation, but the PRICOR evaluation found that the *secouristes* in particular were often lacking the local acceptance which was essential for them to be effective (AID8904).

Niger's National Health Information System (SNIS) reported in 1991 that 54.7 percent of villages were covered by VHTs, but other estimates are closer to 45 percent. About 20 percent of MSP health facilities (only those at district level) have outreach teams which provide some additional preventive coverage, particularly vaccinations. Mobile clinics provide a further but undetermined degree of preventive coverage. The PRITECH assessment team considered redynamized VHTs to be the most feasible option for expanding coverage (AID9214).

### Private Sector Services

The government of Niger is said to support the expansion of the private sector in all aspects of health care delivery and population activities (CAB9309). A government program offers public health workers the opportunity to retire early with seed money in order to open private clinics in villages which are not served by a public dispensary, according to a recent report by USAID's BASICS project. In January 1994, formal private health services reportedly included three hospitals, 10 doctor's offic s, 48 primary care clinics, three women's health centers, and 16 other private clinics of various kinds. Drugs were reported to be available from 13 private pharmacies, 24 "popular" pharmacies, and 215 pharmacy depots. International private voluntary organizations (PVOs) active in the health sector include Africare, CARE, and Helen Keller International (AID9417).

High use of traditional and herbal remedies is evidenced by the results of a 1987 health care utilization survey, which found that inhabitants living within five kilometers of a rural health facility used it for curative services for only 54 percent of recent illnesses. A 1989 Health Facilities Survey concluded that the majority of the population in outlying areas and even much of the population in urban areas use traditional medicine (AID9214).

## Health Care Financing

According to the World Bank, total expenditure on health amounted to $126 million in 1990, equivalent to five percent of Niger's gross domestic product (GDP). As a share of GDP, this is just above the average level for sub-Saharan nations and developing nations in general (see figure 3.7). The Bank's calculations are based on available data on domestic government spending and official foreign aid as well as a general estimate of the level of private spending on health. As illustrated in figure 3.8, each of these three sources was estimated to account for about one-third of total health spending. (An earlier assessment focussing on recurrent costs in 1984 appears to the right in figure 3.12.)

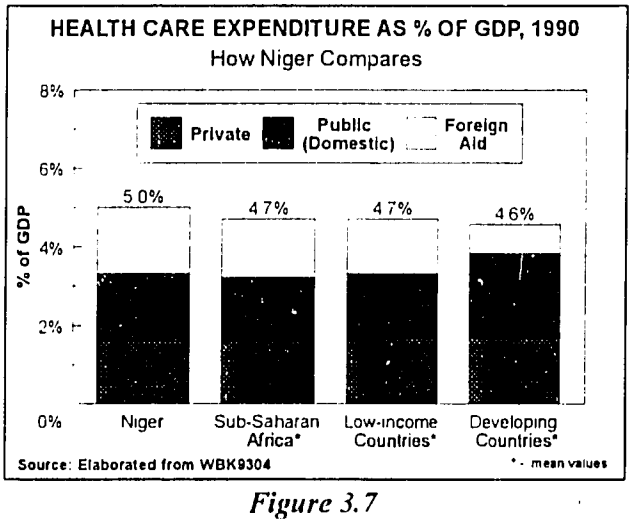


*Figure 3.7*

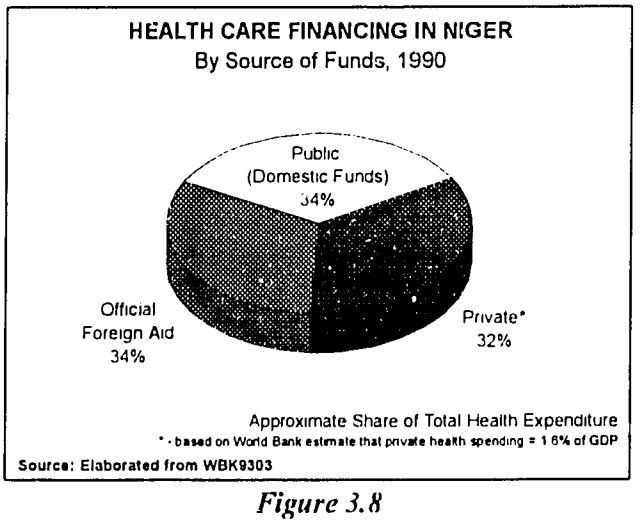


*Figure 3.8*

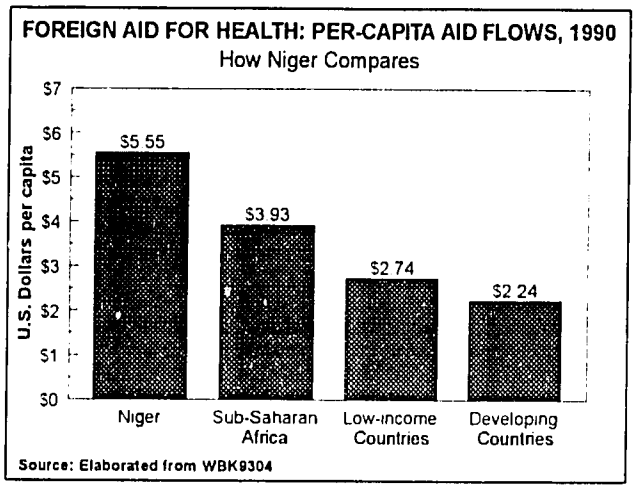


*Figure 3.9*

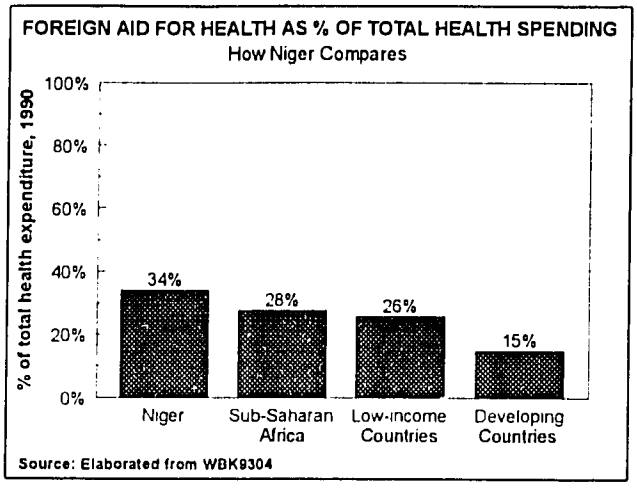


*Figure 3.10*

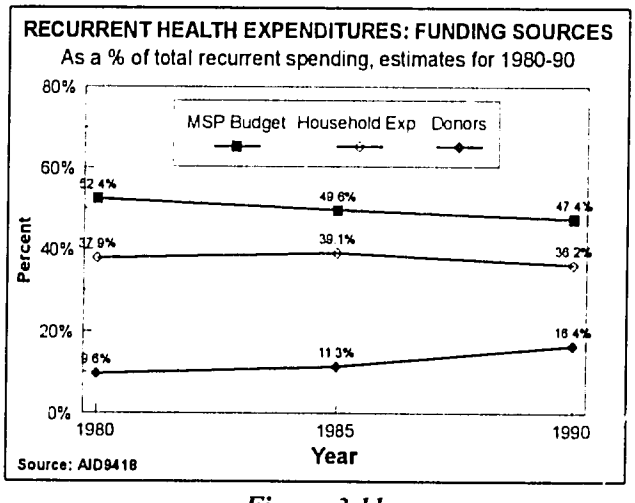


*Figure 3.11*

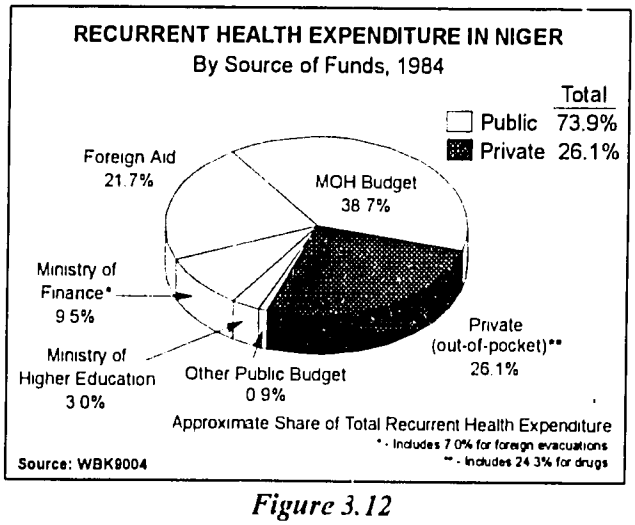


*Figure 3.12*

**Foreign Aid**. According to the World Bank's calculations, per-capita foreign aid flows for health in Niger were among Africa's highest in 1990 at $5.55 (see figure 3.9). The 34 percent share of total health spending attributable to foreign aid also exceeds levels estimated for sub-Saharan nations and developing countries (see figure 3.10). As illustrated in figure 3.11, a recent study conducted for USAID found that donors have provided an increasingly large proportion of recurrent funding while domestic government and private household expenditures dropped slightly in significance in the course of the 1980s (AID9418). An earlier study by the World Bank, however, estimated that foreign aid funded an even higher share (21.7 percent) of recurrent costs in 1984 (see figure 3.12).

## Public Financing

The majority of domestic public funding for health goes through the MSP. As indicated in figure 3.12, the Ministries of Finance and Education also directly fund some health activities in Niger. Although the MSP is the major deliverer of health care services in Niger, its budget contributes less than half of total recurrent spending on health, according to the various estimates presented here. Shortages of drugs, personnel, and vehicles due to lack of government funds are one of the health sector's most serious constraints. Patients at MSP health facilities are typically instructed to buy prescribed drugs at nearby pharmacies or depots, including *pharmacies populaires* and other outlets managed by ONPPC, the parastatal drug supply agency (AID9214).

**Domestic Funding Trends.** Figures 3.12 and 3.13 depict changing levels of government investment in health in the 1980s. After averaging a 4.5 percent share of total government spending in the late 1970s, public expenditure on health dropped to as low as 2.4 percent before recovering somewhat in the mid-1980s (see figure 3.13), according to figures provided by the World Bank. The 1991 health sector assessment carried out under USAID's PRITECH project reported government spending on health at a generally constant level of 5.3 percent of the total budget in the late 1980s (AID9214). A more recent examination of recurrent budget figures also estimated the MSP's share at roughly five to seven percent throughout the 1980s (AID9418).

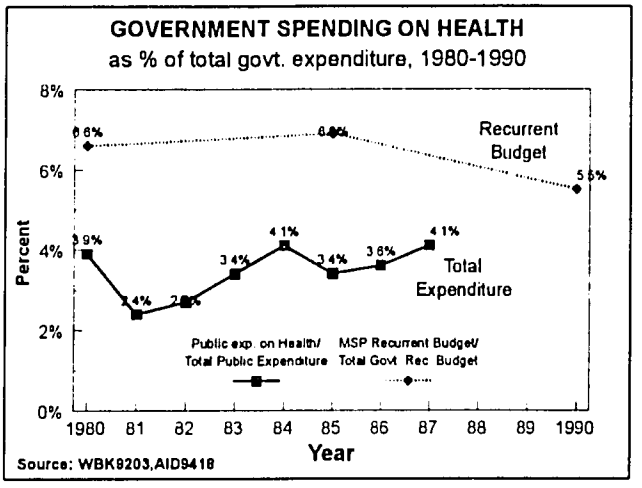


*Figure 3.13*

Measured in real terms per-capita, health spending in the 1980s represented a modest increase over the average level from the late 1970s of $2.20 per person (1987 U.S. Dollars), according to the World Bank (WBK9203)(see figure 3.14). Recurrent budget figures suggest a 37 percent rise in real per-capita spending between 1980 and 1990 (AID9418). The 1991 PRITECH assessment, however, cited estimates that real per-capita expenditure had declined slightly in the previous five years (AID9214).

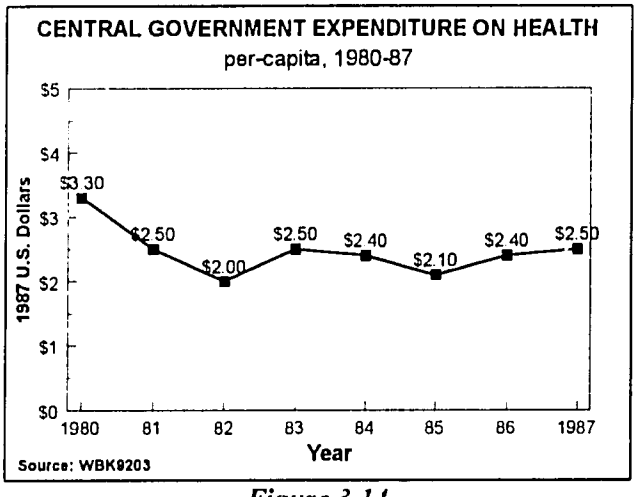


*Figure 3.14*

**Allocation of Funds.** Budget allocations to the MSP are generally based on historic levels of funding and bear little relation to population served or actual needs of facilities. Once the MSP's personnel budget is funded, the operating budgets requested by each division must be cut down, generally to the previous year's level. Personnel costs consistently absorbed over 50 percent of recurrent expenditures in the mid-1980s (AID8905) and reached a high of 58 percent of the MSP operating budget in 1990 (AID9418). Meanwhile, budget allocations declined for transport, medicines and vaccines, and building and vehicle maintenance (see figure 3.15). Allocations for medical supplies for primary care services came to less than 25 percent of requested amounts in 1989 and 1991 (AID9214). The marked decline in public spending on drugs means that patients at public facilities are increasingly forced to purchase drugs from private sources (AID9418).

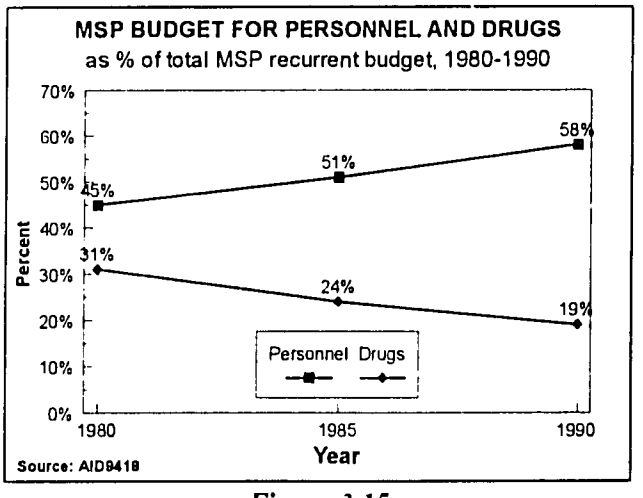


*Figure 3.15*

The PRITECH assessment noted a clear bias in domestic funding favoring centralized functions and urban, hospital-based care, especially in the two national reference hospitals, which reportedly received over one-third of the MSP's total "material" budget (AID9214). A recent examination of recurrent budget figures found that total

allocation to hospitals had risen from fifty percent of the recurrent health budget in 1980 to 57 percent in 1985 and 58 percent in 1990 (AID9418). However, a hospital financing study conducted under USAID's Niger Health Sector Support Grant project reported that hospitals received just 30 percent of the MSP's operational budget in 1988, well below the range of hospital spending reported for five other sub-Saharan nations. The study noted that Niamey National Hospital received 55 percent of all hospital resources in 1987 (SSM9401). Funding for rural programs is largely left in the hands of external donors, but in the early 1990s both the World Bank and USAID were disbursing less funds for these purposes than had been anticipated by the Government of Niger (AID9214).

**Cost Recovery**. The MSP has accepted charging for drugs in public health facilities as a policy and has conducted various pilot tests of alternative cost recovery schemes, including the Bamako Initiative approach. User fees have been applied in hospitals since the 1960s. Unfortunately, most of the funds must be returned to the Ministry of Finance, reducing the hospitals' incentive to collect fees (AID9214). The ministry has now structured a fee system with the highest user charges for outpatient care at central hospitals, medium charges at district hospitals, and the lowest charges at PHC facilities (AID9507). Civil servants, students, and indigents are exempted from fees; employees of private companies pay higher fees than public sector patients for private rooms, diagnostic exams, and surgical procedures. Exemptions are also permitted for surgical procedures, inpatient diagnostic exams, infectious diseases, and psychiatric patients, as well as all outpatient visits for children. Survey results from the hospital financing study indicate that user fees are loosely defined and somewhat randomly applied and thus do not realize their full potential impact (SSM9401).

The hospital financing study reported that the Niamey National Hospital recovered 16 percent of operating costs in 1988, including 27 percent of operating costs for outpatients but only five percent for inpatients (SSM9401). Since 1992, the government has begun to give partial financial and managerial authority to the hospital, facilitating a modest five percent increase in revenue collection between 1992 and 1994. Increases in cost recovery at some district hospitals have been more dramatic (AID9507).

**Social Insurance**. After a pilot project in a rural district, the MSP has recently decided to extend a social financing system using a local tax plus copayment for each illness. The pilot district covered a higher percentage of medicine costs, received higher community satisfaction ratings, and had higher utilization rates than a control district where only direct fee-for-service payments were made (AID9507).

## Private Financing

The World Bank estimates that private expenditures on health amounted to roughly 1.6 percent of GDP in 1990, or just less than one-third of total expenditures on health (WBK9303). The earlier study by the World Bank estimated out-of-pocket expenditures to account for about 26 percent of total recurrent health expenditures in 1984 (see figure 3.12) (WBK9004). These estimates may seem low relative to the level of private sector activity found in other countries, but they are considerably higher than an estimate by AID's REACH project that only seven percent of overall recurrent health expenditure occurred outside of the public sector in 1984 (AID8905).

Private health care is offered on a fee-for-service basis; there is no evidence of private health insurance (WBK9007). Analyzing expenditure data for 1984, the World Bank attributed over 90 percent of private health spending to purchases of drugs (WBK9004). A more recent survey found that Nigerien households bought drugs for 43 percent of illnesses. According to a report by AID's Health Financing and Sustainability (HFS) Project, the proportion of drugs bought privately in Niger rose from 70 percent in 1980 to 80 percent in 1990 (AID9507).

The percentage of personal income spent on health care by Nigeriennes varies greatly with income level. A study conducted by the HFS project in Boboye found that the poorest ten percent of residents spent less than five percent of income on health care while the richest spent 12.5 percent; middle income groups were found to spend roughly six to eight percent of their income in health (AID9417).

# IV. HIV INFECTION AND AIDS

HIV/AIDS poses a formidable threat in Niger, but its impact thus far has been less severe than in many other sub-Saharan nations. Figure 4.1 illustrates the growing number of AIDS cases reported to WHO since 1987. At the end of 1993, the cumulative total was approaching one thousand. Cases reported in 1992 produce an incidence rate of four per 100,000 people, lower than most neighboring nations (WHO9501). According to USAID's mission in Niger, total reported cases reached 1,262 in 1993, with nearly two-thirds in Niamey (CAB9503). Actual total incidence is certain to be considerably higher. WHO's Global Program on AIDS (WHO/GPA) estimated that there had been 3500 cases of AIDS by 1993 and projected that total to swell to 8700 by 1998 (WBK9502).

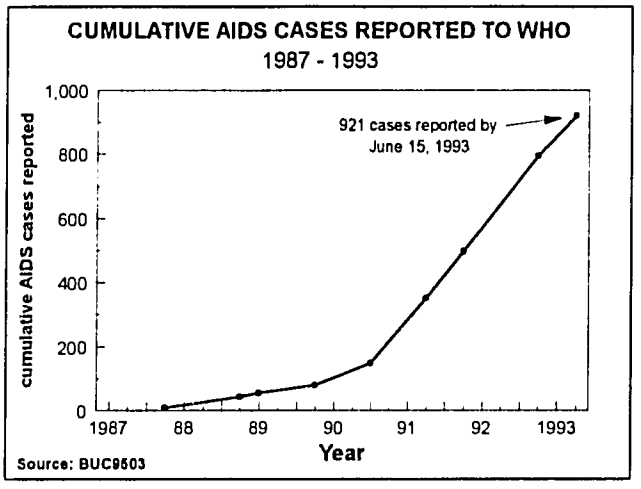


*Figure 4.1*

Of 809 cases reported by the government through 1992, more than three-quarters occurred among males, roughly the same share estimated in the WHO/GPA model. Of persons with AIDS whose age was specified, 37 percent were in their thirties and 32 percent in their twenties. Nine cases had been reported among children under the age of 15, including five cases among children under five years old. HIV-1, the predominant strain, was found in 88 percent of the AIDS cases, while HIV-2 was found in the remaining 12 percent (WBK9502).

HIV seroprevalence tests provide a much better indication of current and possible future trends. Tests in Niger indicate that HIV has infected less than one percent of the general population, much lower than in most sub-Saharan nations (see figure 2.33 above). Figure 4.2 summarizes test results of low and high-risk groups in Niamey for each strain. Testing for HIV-1 among pregnant women in a rural area in Tahoua in 1992 produced a similar low-risk seroprevalence level of 1.4 percent (BUC9503). Results of tests among various other population groups over time are displayed in figures 4.3 - 4.6. While infection with HIV-2 may be waning, HIV-1 seroprevalence levels are clearly on the rise. Rises are most pronounced among high-risk populations such as prostitutes, who are up to ten times more likely to have contracted HIV than the general population. A strong correlation has also been identified between seasonal migration to coastal areas such as Cote d'Ivoire and AIDS incidence among men in Niger (ICA9201).

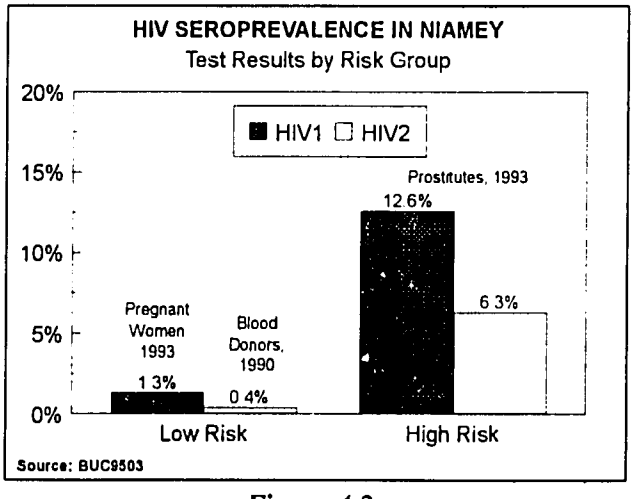


*Figure 4.2*

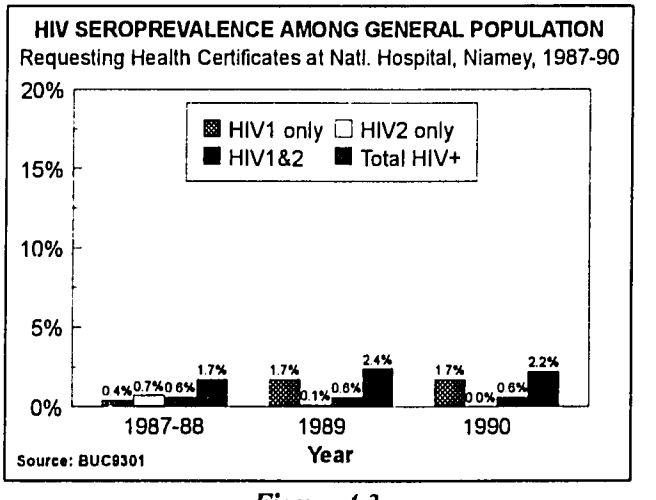


*Figure 4.3*

## National AIDS Control Program

**Programme National de Lutte contre le SIDA** (PNLS). The PNLS is guided by a multi-sectoral National AIDS Committee (NAC). The lead ministry, the MSP, has cooperated with the Ministry of Education to promote HIV/AIDS awareness among Niger's youth (WHO9301). Within the MSP, prevention and control of HIV/AIDS and other STDs are the reponsibility of the Directorate of Surveillance, Epidemiology and Prevention (DSEP). Interventions supported by USAID/Niger include educational outreach targetting high-risk populations in Niamey, particularly prostitutes and truckers. After two years of efforts, a 1994 survey indicated that 90 percent of CSWs were using condoms with their clients and 50 percent of truckers, migrants and STD patients reported using a condom with their last "occasional" partner (CAB9503).

## Local Non-Governmental Organizations with AIDS Activities

**Croix Rouge Nigerienne** (Red Cross of Niger), a member of Niger's National AIDS Committee, contributes to mass media public education efforts, provides material assistance to government and NGO health workers, and incorporates HIV/AIDS prevention into its primary health care activities (WHO9102).

**SWAA/Niger** (Society for Women and AIDS in Africa, Niger Chapter) has promoted the role of mass media to prevent the spread of HIV/AIDs (WHO9301).

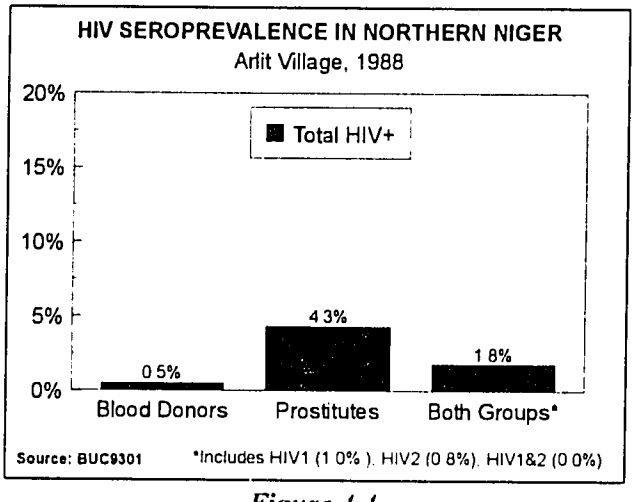


*Figure 4.4*

### International NGOs with AIDS activities in Niger (WHO9102,CAR9300)

CARE
Center for International Cooperation on Health and Development (CCISD), Quebec

### International Donors supporting AIDS activities in Niger (GAP9200,WHO9301)

United Nations Children's Fund (UNICEF)
U. S. Agency for International Development (USAID)
The World Bank
World Health Organization, Global Programme on AIDS (WHO/GPA)

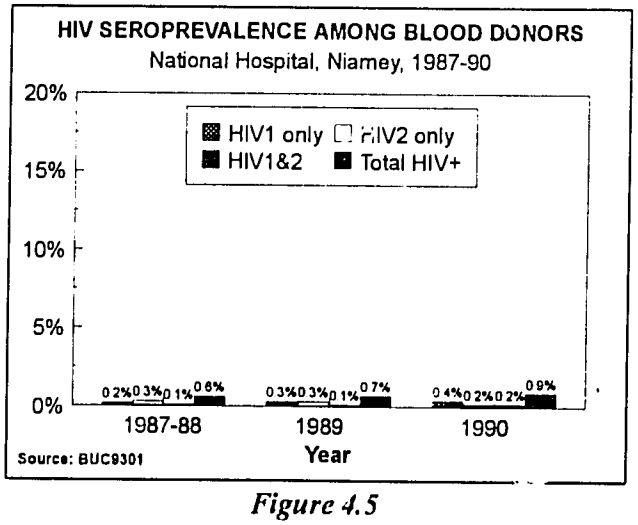


*Figure 4.5*

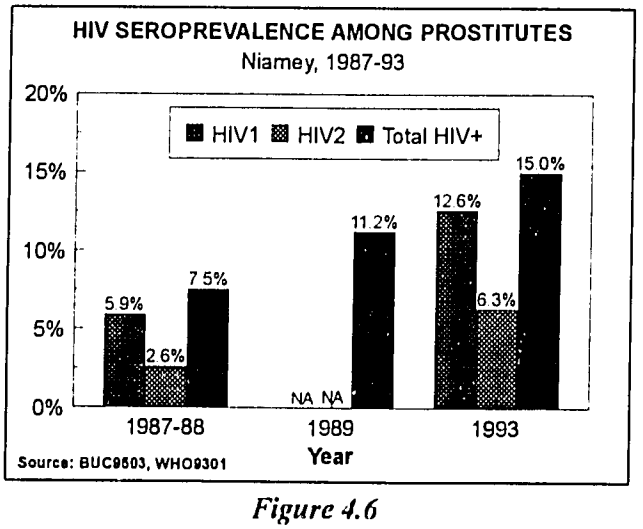


*Figure 4.6*

# APPENDIX A: STATISTICAL APPENDIX

## Trends in Selected Demographic and Health Indicators

| INDICATOR | 1950 | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | SOURCE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Population (000s) | 2,400 | 2,689 | 3,028 | 3,660 | 4,165 | 4,771 | 5,586 | 6,608 | 7,731 | 9,151 | 10,805 | UNP9400 |
| Infant Mortality | 212 | 202 | 191 | 181 | 171 | 162 | 152 | 140 | 129 | 119 | 110 | UNP9400 |
| Under Five Mortality | 434 | 413 | 390 | 368 | 347 | 327 | 305 | 281 | 258 | 237 | 217 | JEE9502 |
| Crude Birth Rate | - | 54 | 54 | 56 | 58 | 60 | 60 | 58 | 54 | 51 | 49 | UNP9400 |
| Crude Death Rate | - | 31 | 29 | 27 | 26 | 25 | 23 | 21 | 20 | 18 | 16 | UNP9400 |
| Avg. Annual Growth Rate | - | 2.3 | 3.1 | 3.2 | 2.7 | 2.9 | 3.3 | 3.3 | 3.3 | 3.4 | 3.3 | UNP9400 |
| Total Fertility Rate | - | 7.1 | 7.3 | 7.6 | 7.9 | 8.1 | 8.1 | 7.9 | 7.6 | 7.3 | 6.8 | UNP9400 |

*Table A1. Population Growth and Mortality Trends, 1950-2000*

| YEAR | ORS Access | ORS/RHF Use | SOURCE |
|---|---|---|---|
| 1984 | NA | NA | |
| 1985 | 4 | 1 | WHD8700 |
| 1986 | NA | NA | |
| 1987 | 9 | 24 | WHD8900 |
| 1988 | 44 | 38 | WHD9000 |
| 1989 | 47 | 54 | WHD9100 |
| 1990 | NA | NA | |
| 1991 | 81 | 54 | WHD9201 |
| 1992 | 65 | 17 | WHD9300, DHS9206 |
| 1993 | NA | NA | |
| 1994 | NA | NA | |

*Table A2. ORS Access and ORS/RHF Use, 1985-1992*

*Table A3. Access to Safe Water and Adequate Sanitation, 1980-1988*

| YEAR | ACCESS TO SAFE WATER | | ADEQUATE SANITATION | | SOURCE |
|---|---|---|---|---|---|
| | Rural | Urban | Rural | Urban | |
| 1980 | 30 | 41 | 3 | 36 | AID9012 |
| 1981 | NA | NA | NA | NA | |
| 1982 | NA | NA | NA | NA | |
| 1983 | 33 | 41 | 3 | 36 | WHO9101 |
| 1984 | NA | NA | NA | NA | |
| 1985 | 49 | 35 | NA | NA | WHO9101 |
| 1986 | NA | NA | NA | NA | |
| 1987 | NA | NA | NA | NA | |
| 1988 | 49 | 36 | 3 | 36 | AID9012 |
| 1989 | NA | NA | NA | NA | |

| YEAR | VACCINATION COVERAGE | | | | | SOURCE |
|---|---|---|---|---|---|---|
| | BCG | DPT3 | Measles | Polio 3 | TT2+ | |
| 1981 | 28 | 6 | 19 | 6 | 1 | WHE8700 |
| 1982 | NA | NA | NA | NA | NA | |
| 1983 | NA | NA | NA | NA | NA | |
| 1984 | NA | NA | NA | NA | NA | |
| 1985 | NA | NA | NA | NA | 5 | CABXX04 |
| 1986 | NA | 5 | NA | NA | 3 | WHE8900 |
| 1987 | NA | NA | NA | NA | NA | |
| 1988 | 39 | 16 | 24 | 16 | NA | MRF8906 |
| 1989 | NA | NA | NA | NA | NA | |
| 1990 | 50 | NA | NA | 13 | 44 | WHE9100 |
| 1991 | 38 | 18 | 24 | 18 | 5 | WHE9202 |
| 1992 | 35 | 17 | 20 | 17 | 14 | DHS9306 |
| 1993 | NA | NA | NA | NA | NA | |

*Table A4. Vaccination Coverage, 1981-1992*

| Region | VACCINATION COVERAGE at age 12-23 mos. | | | | |
|---|---|---|---|---|---|
| | BCG | DPT3 | Measles | Polio3 | complete |
| Niamey | 94.1 | 74.9 | 70.9 | 74.4 | 61.1 |
| Dosso | 44.9 | 12.0 | 27.7 | 12.0 | 11.6 |
| Maradi | 45.5 | 18.4 | 35.5 | 18.4 | 15.7 |
| Tahoua/Agadez | 36.5 | 21.9 | 26.6 | 20.9 | 19.1 |
| Tillaberi | 30.6 | 14.4 | 19.9 | 14.4 | 13.0 |
| Zinder/Diffa | 28.6 | 15.4 | 17.5 | 15.6 | 12.2 |
| NIGER | 39.9 | 20.3 | 27.8 | 20.1 | 17.4 |
| Source: DHS9306 | | | | | |

*Table A5. Vaccination Coverage, by Region, DHS 1992*

| PUBLIC EXPENDITURE ON HEALTH CARE IN NIGER | | |
|---|---|---|
| Year | as % of total govt. expenditure | $US (1987) per-capita |
| 1980 | 3.9% | $3.30 |
| 1981 | 2.4% | $2.50 |
| 1982 | 2.7% | $2.00 |
| 1983 | 3.4% | $2.50 |
| 1984 | 4.1% | $2.40 |
| 1985 | 3.4% | $2.10 |
| 1986 | 3.6% | $2.40 |
| 1987 | 4.1% | $2.50 |
| Source: WBK9203 | | |

*Table A6. Public Expenditure on Health Care in Niger, 1980-1987*

*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 definiton 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.
**Appropriate Infant Feeding:** A composite estimate of the proportion of infants (children under age one) being breastfed and receiving other foods at an appropriate age according to the following criteria: breastfed through infancy with no bottle-feeding, exclusively breastfed through four months (120 days) of age, and receiving other foods if over six months of age (181 days). Water is not acceptable in the first four months (120 days). ORS is considered acceptable at any age. A number of sub-indicators may be calculated from the data used to form the composite, of which two may be presented here:
**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.

**Anemia among Pregnant Women:** (prevalence): Estimate of the proportion of pregnant women whose blood hemoglobin level is below the WHO norm of 110 grams per liter.

**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.

**Gross Domestic Product:** Total output of goods and services for final use produced by residents and non-residents, regardless of allocation to domestic and foreign claims.

**Gross National Product:** Total domestic and foreign value added claimed by residents.

**Health Care Expenditure.** Data from the World Development Report 1993 on health expenditure include "outlays for prevention, promotion, rehabilitation, and care; population activities; nutrition activities; program food aid; and emergency aid specifically for health." Spending on water and sanitation is not included. Expenditure is expressed in official exchange rate U.S. Dollars. **Public Expenditure** includes government and parastatal health expenditure and foreign aid. Domestic public expenditure does not include foreign aid. Where IMF data is used for time series, these definitions may vary. **Private Expenditure** comprises total household spending on health based on surveys or (where indicated) imputed from regressions based on GDP per capita. **Foreign Aid** represents total official aid flows, the sum of all assistance for health by bilateral and multilateral agencies and by major international NGOs.

**HIV Seroprevalence:** Estimate of the proportion of a given population infected with HIV. Where specified, data are disaggregated by strain (HIV-1 or HIV-2) and by risk group. **Low-Risk Population** includes persons with no known risk factors; estimates are typically drawn from test results among pregnant women, the general population, or blood donors. **High-Risk Population** includes persons with known risk factors; these estimates are typically drawn from test results among commercial sex workers, their clients, or patients at STD clinics.

**Population per Doctor & per Nurse:** Estimates of the ratios of total population per doctor and total population per nursing person. Because definitions of doctors and nursing personnel vary, the data for these two indicators are not strictly comparable across countries. "Nursing persons" may include auxiliary nurses and paraprofessional personnel such as trained traditional birth attendants.

**Prenatal Care for Pregnant Women:** The proportion of pregnant women who attended prenatal (antenatal) care clinics in a given year.

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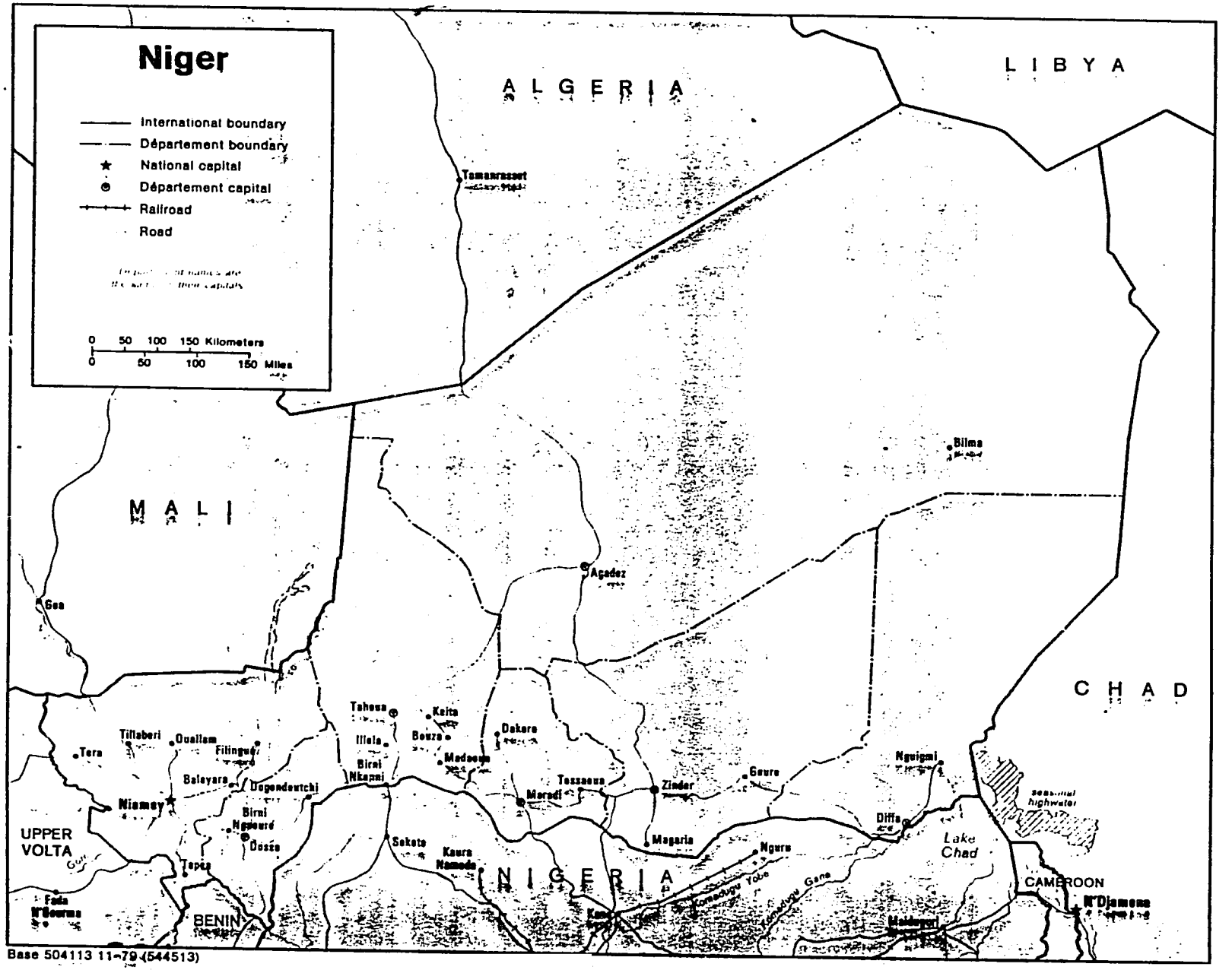


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