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Urban EPI in Niger: A Brief Assessment

September 30 - October 2, 1991



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A Brief Assessment

September 30 - October 2, 1991

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ACRONYMS

AID	Agency for International Development
BCG	Bacillus Calmette Guerin
EPI	Expanded Program on Immunization
IEC	Information, Education, and Communication
MOH	Ministry of Health
MSF	Médecins Sans Frontières
PEV	Plan Elargi de Vaccination
PHC	Primary Health Care
R&D/H	Bureau for Research & Development (Health)
REACH	Resources for Child Health Project
SNIS	Tulane University Contract Team
WHO	World Health Organization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

I. Introduction

With the concurrence of USAID/Niamey, a two member REACH team visited Niger from September 30 - October 2, 1991 to explore possibilities for special urban and measles control efforts within the existing national Expanded Program on Immunization (EPI). This visit coincided with A.I.D./R&D/H intentions to begin an urban EPI initiative and measles control in selected African countries.

The team consisted of an EPI specialist and an urban planner. Discussions were held with staff of USAID/Niamey, Tulane University Contract Team (SNIS), EPI-MOH, Ministère de l'Équipement, DHHM, UNICEF, WHO, and Médecins Sans Frontières (MSF). A list of persons contacted appears in Appendix 1.

Although the team was present in Niger for only three working days, and had insufficient time to travel to the field, certain impressions nevertheless could be made about the accomplishments in the health sector and hopes for its future.

II. Background

Niger suffered a severe measles epidemic which began in late 1990, and continued through mid-1991. A very competent investigation by MSF revealed that the epidemic had its inception in Niamey from which it spread throughout the country. The epidemic was attributed to low measles immunization coverage and accumulation of susceptibles since the last epidemic in 1985. Attack rates were particularly high among infants 6-8 and 9-11 months of age. Some 14,000 cases were reported. Vaccine efficacy was measured in three different ways and was found to be uniformly high at nearly 90 percent. This suggests that the cold chain in Niger functions well. The report also showed that new arrivals in Niamey were twice as likely as long-term residents to contract measles.

On their tour through Africa in January 1991, The Honorable Louis W. Sullivan and The Honorable Ronald W. Roskens, in a report to the President of the United States of America, reaffirmed their commitment to increasing immunization coverage in order to maintain the advances in child survival made in the last decade. They state that: "U.S. assistance efforts should focus on sustaining efforts in targeted child survival activities in such ways that develop indigenous primary health care systems." They also state that the USAID Measles Initiative, announced by President Bush at the World Summit for Children in October 1990 and intended to reduce deaths from measles by 95 percent by 1995, should be focused in Africa, where one-third to one-half of measles deaths now occur.

III. Progress in the Niger EPI

Some distinct observations provide hope that the Niger EPI will be able to greatly improve its performance in the near future.

- A. Niger has completed its national census in 1988. The population and demographic information is essential for EPI program planning,

monitoring, and evaluation. Health facility catchment areas can be defined, and performance can therefore be monitored. Many other countries which are more advanced in their EPI do not have this critical baseline information.

- B. Considerable investment by the MOH and donors since the mid-1980s in the primary health care infrastructure is about to pay dividends. USAID/Niamey has just begun a health sector assessment and is thoughtfully identifying how its assistance can address the organizational and structural needs in the health sector.
- C. EPI has traditionally relied upon three strategies to deliver services: fixed sites (serving populations up to 5 kilometers from the health facility), outreach from fixed sites (5-15 kilometers), and mobile teams to cover areas more than 15 kilometers from the fixed sites. It is worth noting that the mobile teams operate under the DHHM, a separate service from EPI which has primary responsibility for epidemic control.
- D. EPI is systematically increasing the proportion of doses given within fixed sites, which will help to achieve and sustain coverage and decrease reliance on costly mobile operations.
- E. EPI leadership is present. Coverage levels of BCG and particularly tetanus toxoid for women of childbearing age have increased considerably, as measured by coverage surveys in 1988 and 1990. Coverage has increased for all antigens (Appendix 2). Retention of vaccination cards is extremely high. Completeness of routine reporting of service statistics is thought to be high, given the close agreement between coverage surveys and the routine reporting system.
- F. The EPI in Niger is a very young program compared to most other countries of the world, having only begun in 1988. Current low EPI coverage figures do not reflect the considerable amount of work necessary for establishing a solid infrastructure.

IV. EPI Challenges for the Future

Nevertheless, significant problems must be overcome. The USAID health sector assessment provides a sobering view of what remains to be done in the EPI, and in the health sector in general. Delivery of services must be integrated. Authority and budgetary allocations need to be decentralized. The Ministry of Health (MOH) must set for itself, and the donors, clear goals and identify its priorities. Data are either unavailable or, even when available, infrequently used or fed back to lower levels to inform rational decision-making.

Given the underdeveloped state of the health infrastructure in Niger, donors need to lengthen their traditional planning horizons, and formulate sector-wide as well as project-specific goals. Regular collaboration and joint planning among donors with the MOH should be encouraged.

EPI had a late start in Niger compared to practically all other countries. Consequently coverage remains very low (Appendix 3a - 3c). With the global

goal of Universal Child Immunization by 1990 having already passed, Niger risks losing donor attention at a critical period in its EPI development. EPI is breaking new ground for health care in Niger and deserves unwavering support. EPI is paying a disproportionate share of costs for developing the infrastructure which, in fact, will benefit the entire Primary Health Care (PHC) system which is slowly developing.

Two noteworthy problems which EPI specifically faces are the high drop-out rates between successive doses and the unfamiliarity of 40 percent of its population with the very notion of disease prevention.

V. Observations

USAID/Niamey appropriately encourages the MOH to concentrate on health sector reform and structural adjustments, including manpower planning, resource management, and integrated national planning. In its interview with staff, review of documents, and analysis of available data, the team identified certain pressing needs. In light of the general underdevelopment of the health sector, parochial, project-specific interests should not be allowed to dominate. Donor preoccupation with one specific topic or another should be restrained for the overall benefit of PHC development. Projects will succeed or fail to the extent that the primary health care infrastructure can be developed and decentralized and an integrated package of services delivered. Without these necessary preconditions, any single vertical approach is doomed to failure.

Nevertheless individual projects such as EPI can aid this overall PHC development, and in the process help itself, by finding linkages with other projects - e.g., family planning, trachoma control, etc. Niger's EPI currently makes approximately 750,000 contacts per year with families. This is an opportunity to deliver other messages and services which the country cannot afford to miss.

Within EPI, the overriding need appears to be to increase the quantity, quality, and efficiency of immunization services in existing health facilities. While strengthened Information, Education, Communication (IEC) activities are essential to increase the demand for services and reduce drop-out rates, EPI must especially concentrate on reducing missed opportunities for immunization, particularly given the concerns expressed about the availability of future resources. Less than half of the approximately 400 health facilities in the country currently offer immunization services. Provision of cold chain equipment for the remaining facilities would be a cost-effective investment for increasing coverage. Resources should also be provided to permit regular outreach visits from every health facility as another means to increase immunization coverage. More facilities may be needed in the highly populated, under-served southern regions of the country.

The goal of EPI is not to improve immunization coverage, but to reduce morbidity and mortality. Strategies to control infectious diseases should be epidemiologically sound. For example, improving immunization coverage in dense, overcrowded urban areas, without detracting from rural activities, is likely to lead to less frequent outbreaks. Low immunization coverage, high

population density, high birth rates, and high rates of in-migration of susceptible children into Niamey contributed to rapid transmission among the very young, for whom measles is particularly severe. Due to the early age of infection, intensity of exposure, and prevalence of malnutrition in vulnerable low income settlements, cities require higher immunization coverage than sparsely settled rural areas in order to reduce more effectively mortality from measles. More effective measles prevention in cities and densely settled areas results in less frequent exportation into rural areas. Despite having the highest measles immunization coverage in the nation, Niamey was nevertheless the source of the recent epidemic, and was responsible for introducing measles throughout the country.

An epidemiologically sound strategy is to identify pockets of low coverage. EPI managers in Niger need to be alert to the special challenges and unique opportunities for creative approaches in urban and densely settled areas. For example, seasonal population movements and locational aspects are well-known and provide an opportunity to reach these otherwise inaccessible populations with essential services. Information from existing early warning systems which monitor impending food shortages can also be used to prepare for movements of populations which need immunization.

Census figures should be analyzed and catchment populations calculated for each health facility. Immunization coverage targets can then be established and staff trained to monitor progress. As the former Director of the WHO/EPI program stated: "in public health, what gets measured gets done". An assessment tool which has been used elsewhere in Africa with great success is the "nearest 100 households survey". The purpose is for the health worker and community to ascertain immunization coverage in the immediate vicinity of the health facility. The level of coverage is often found to be surprisingly low despite easy access. By venturing into the community, the health worker learns about some of the constraints which must be overcome. Over the next few years, the extension of the immunization grid and adoption of innovative delivery strategies to ensure the immunization of each cohort of children in each geographic area will largely determine the magnitude of the next measles epidemic, which can be expected to occur approximately in 1994, if not sooner.

The team was surprised to discover from the SNIS data that, contrary to popular belief, the vast remote regions of the country in the north and east have greater access to and utilization of health facilities (Appendices 4, 5, 6, 7, 8). Consequently these regions suffered a lower attack rate from measles during the 1990-91 epidemic (Appendices 9 and 10). Niger has every reason to be proud of having achieved high coverage in the remote regions of the country. This provides the clearest proof that existing strategies in Niger can work. It is now time to ensure more equitable provision of services by attending to the needs of the relatively under-served, most densely populated southern region.

VI. Conclusions

- An inter-agency multi-year EPI plan is needed.
- An "Urban EPI focus" is too narrow for Niger.

- The overall primary health care system needs improvement.
- By mobilizing additional funds for improved measles control, EPI can lead the way to improved primary health care.
- Funds to extend the cold chain to remaining fixed facilities and motorcycles for outreach must be identified rapidly.
- Long-term targeted technical assistance is needed, as well as local funds for program support and problem-solving operational research.
- The presence of expert technical assistance can help to mobilize donor funds.
- There is every reason to expect that Niger can attain the same kinds of high coverage levels as other countries which have equally daunting constraints, but in less time because Niger has the advantage of being able to apply lessons learned from other countries.
- EPI technical assistance from REACH, supplemented with financial inputs from local donors like USAID/Niamey and UNICEF, could be a powerful stimulus for improved disease control in Niger and would be well-appreciated by the MOH.
- USAID/Niamey strongly believes that Niger should be provided with additional central funds for more effective measles control.

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APPENDIX 1

Persons Contacted

Ministere de la Sante

Dr. Abdou Moha, Directeur Generale de la Sante
Dr. Idi Moussa Djataou, Directeur PEV
Dr. Abdou Saley, Directeur Adjoint PEV
Dr. Garba Soga, Directeur du Service National de l'Hygiene et
de la Medecine Mobile (DHMM)

Ministere d'Equipment

Mr. Abdou Mahamane, Chef Service des Etudes

USAID/Niger

Mr. Carl S. Abdou Rahman, Health Development Officer
Ms. Helen Soos, General Development Officer
Mr. O. Kane, Health Sector Coordinator
Ms. Susan Wright, Population Development Officer
Ms. Nancy Lowenthal, Health & Child Survival Fellow
Ms. Sylva Etian, Technical Advisor for Child Survival, Nutrition Division
Mr. Ian Sliney, Chief-of-Party, Tulane University
Mr. John Izard, Tulane University

UNICEF/Niger

Mrs. Zerfinesh K. Bendow, Representative
Dr. Maximin B. Ouoba, Administrateur Program Sante
Mr. Bob Davis, UCI Project Officer

WHO/Niger

Dr. Abdou Ibrahim, Chef Equipe Pays
Dr. Maurice Ramakavelo, Representant Adjoint

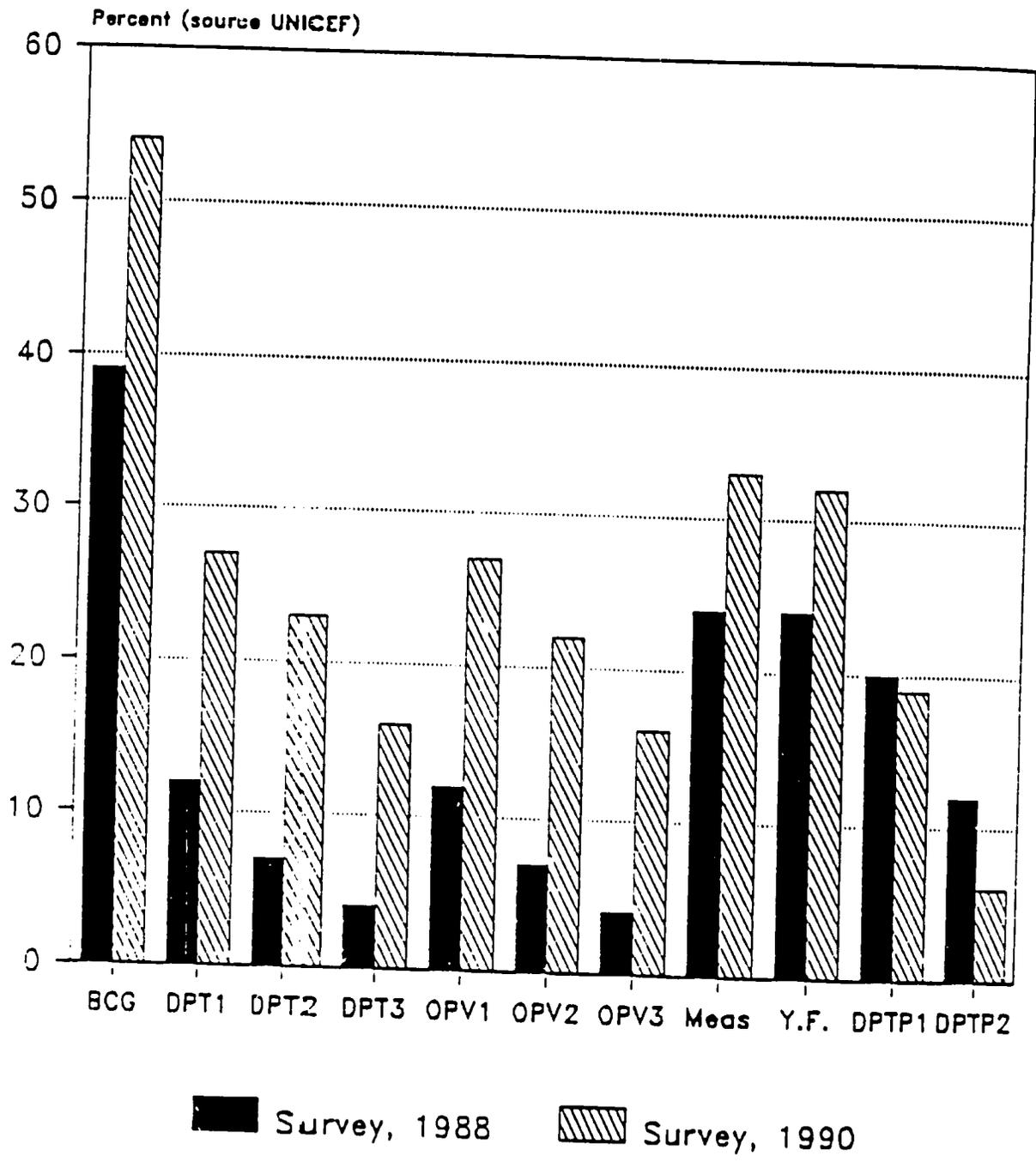
Médecins Sans Frontières

Dr. Monique Lefort, Coordinatrice Medicale

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Vaccination Coverage, 1988-1990

12 to 23 month-olds, Niger
Sample size = 347,000



...including postinfantile vaccinations

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APPENDIX 3a

Annual Regional Immunization Coverage
Region: Africa
Latest data available in 1991

Estimated Immunization Coverage based on
routine reports or nationwide surveys

Ranked on Measles for coverage levels 0 - 99%

Rank	Location	SURVIVING INFANTS (Millions)	BCG Cov	DPT3 Cov	POLIO 3 Cov	Measles Cov	TT 2 Cov	Year of data
1.	SEY Seychelles	0.0018 UW	98%	82%	82%	89%	98%	1990
2.	TAN Tanzania	1.2343 UW	94%	81%	..	88%	50%	1987
3.	SWZ Swaziland	0.0327 UW	96%	89%	89%	85%	63%	1989
4.	ALG Algeria	0.8189 UW	99% S	89% S	89%	83%	27% S	1991
5.	MAS Mauritius	0.0191 UW	94%	90%	90%	83%	94%	1989
6.	MAL Malawi	0.4178 UW	92%	78%	78%	81%	40%	1987
7.	CAV Cape Verde	0.0144 UW	97%	88%	87%	79%	90%	1990
8.	NAM Namibia	0.0684 UW	90%	38%	39%	77%	..	1989
9.	BUU Burundi	0.2285 UW	97%	86%	86%	75%	56%	1990
10.	SIL Sierra Leone	0.1701 UW	98%	83%	83%	75%	77%	1990
11.	RWA Rwanda	0.3232 UW	89%	79%	78%	74%	..	1987
12.	ZIM Zimbabwe	0.3721 UW	85%	77%	77%	73%	46%	1987
13.	COM Comoros	0.0236 UW	91%	71%	73%	71%	23%	1987
14.	LES Lesotho	0.0650 UW	79%	77%	78%	70%	..	1989
15.	STP Sao Tome & Prin	0.0038 CWU	88%	77%	72%	69%	50%	1988
16.	GAB Gabon	0.0432 UW	90%	59%	59%	66%	55%	1987
17.	KEN Kenya	1.0518 UW	80%	72%	72%	65%	..	1986
18.	SEN Senegal	0.3001 UW	88%	67%	67%	64%	32%	1989
19.	SOA South Africa	1.0420	85%	67%	69%	63%	..	1990
20.	BOT Botswana	0.0565 UW	61%	63%	57%	60%	25%	1987
21.	GHA Ghana	0.6042 UW	81%	57%	56%	60%	33%	1990
22.	GUB Guinea-Bissau	0.0352 UW	98%	56%	54%	60%	22%	1987
23.	ZAM Zambia	0.3956 UW	78%	60%	59%	59%	..	1989
24.	UGA Uganda	0.8769 UW	91%	61%	61%	58%	34%	1990
25.	CAF Cen. Afr. Rep.	0.1239 UW	43%	42%	42%	55%	39%	1988
26.	NIE Nigeria	4.6351 UW	96%	57%	57%	54%	58%	1990
27.	MOZ Mozambique	0.6013 UW	49%	38%	38%	44%	19%	1988
28.	ZAI Zaire	1.4867 UW	59%	38%	38%	44%	..	1989
29.	TOG Togo	0.1433 UW	73%	45%	44%	42%	33%	1989
30.	BFA Burkina Faso	0.3675 UW	..	30%	30%	40%	14%	1987
31.	LIB Liberia	0.1047 UW	41%	19%	..	40%	10%	1987
32.	ANG Angola	0.4075 UW	47%	23%	23%	38%	26%	1990
33.	IVC Cote d'Ivoire	0.5426 UW	39%	42%	35%	34%	49%	1989
34.	MAI Mali	0.3916 UW	66%	34%	34%	34%	54%	1990
35.	MAU Mauritania	0.0820 UW	77%	30%	31%	32%	..	1987
36.	MAD Madagascar	0.4814 UW	77%	46%	42%	31%	32%	1989
37.	BEN Benin	0.2075 UW	47%	26%	26%	27%	39%	1987
38.	NIG Niger	0.3465 UW	46%	12%	12%	21%	35%	1990
39.	CHA Chad	0.2166 UW	34%	15%	15%	17%	15%	1987
40.	ETH Ethiopia	2.0789 UW	30%	17%	17%	16%	20%	1989
41.	CAE Cameroon	0.5099 UW	26%	20%	19%	14%	15%	1988
42.	GUI Guinea	0.2513 UW	17%	7%	7%	7%	10%	1989
43.	CNG Congo	0.0974 UW	..	71%	..	..	..	1986
44.	EQG Equat. Guinea	0.0135 UW	28%	3%	4%	..	16%	1985
45.	GAM Gambia	0.0342 UW	96%	77%	82%	..	..	1987
46.	REU Reunion	0.0132 UW
47.	SAH St Helena	0.0001 UW
AFR Africa Region		21.3356	72%	52%	46%	51%	31%	

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APPENDIX 3b

Ranked Annual Drop out Rates

Region: Africa

Latest data available in 1991

Ranked on No Access rate

Rank	Location	Survivors	No Access Diff Out	BCG < 1 Doses Cov	Measles < 1 Doses Cov	BCG - Meas Dropout Diff Out	Year o dat				
1.	GUI Guinea	251290	208571	83%	42719	17%	17590	7%	25129	59%	198
2.	CAE Cameroon	509933	377350	74%	132583	26%	71391	14%	61192	46%	198
3.	EQG Equat. Guinea	13542	9751	72%	3791	28%	...	..	...	..	198
4.	ETH Ethiopia	2078893	1455225	70%	623668	30%	332623	16%	291045	47%	198
5.	CHA Chad	216642	142983	66%	73659	34%	36829	17%	36830	50%	198
6.	IVC Cote d'Ivoire	542609	330992	61%	211617	39%	184487	34%	27130	13%	198
7.	LIB Liberia	104652	61745	59%	42907	41%	41861	40%	1046	2%	198
8.	CAF Cen. Afr. Rep.	123894	70619	57%	53275	43%	68141	55%	-14866	-28%	198
9.	NIG Niger	346533	187128	54%	159405	46%	72772	21%	86633	54%	199
10.	ANG Angola	407506	215978	53%	191528	47%	154853	38%	36675	19%	199
11.	BEN Benin	207457	109952	53%	97505	47%	56014	27%	41491	43%	198
12.	MOZ Mozambique	601344	306685	51%	294659	49%	264591	44%	30068	10%	198
13.	ZAI Zaire	1486684	609540	41%	877144	59%	654141	44%	223003	25%	198
14.	BOT Botswana	56495	22033	39%	34462	61%	33897	60%	565	2%	198
15.	MAI Mali	391638	133157	34%	258481	66%	133157	34%	125324	48%	199
16.	TOG Togo	143284	38687	27%	104597	73%	60180	42%	44417	42%	198
17.	MAD Madagascar	481362	110713	23%	370649	77%	149222	31%	221427	60%	198
18.	MAU Mauritania	81963	18951	23%	63112	77%	26228	32%	36684	58%	198
19.	ZAM Zambia	395624	87038	22%	308586	78%	233418	59%	75168	24%	198
20.	LES Lesotho	65030	13656	21%	51374	79%	45521	70%	5853	11%	198
21.	KEN Kenya	1051759	210352	20%	841407	80%	683643	65%	157764	19%	198
22.	GHA Ghana	604159	114791	19%	489368	81%	362495	60%	126873	26%	199
23.	SOA South Africa	1041991	156299	15%	885692	85%	656454	63%	229238	26%	199
24.	ZIM Zimbabwe	372126	55818	15%	316308	85%	271652	73%	44656	14%	198
25.	SEN Senegal	300118	36015	12%	264103	88%	192075	64%	72028	27%	198
26.	STP Sao Tome & Prin	3790	454	12%	3336	88%	2616	69%	720	22%	198
27.	RWA Rwanda	323178	35550	11%	287628	89%	239151	74%	48477	17%	198
28.	GAB Gabon	43210	4321	10%	38889	90%	28519	66%	10370	27%	198
29.	NAM Namibia	68398	6839	10%	61559	90%	52666	77%	8893	14%	198
30.	COM Comoros	23587	2123	9%	21464	91%	16747	71%	4717	22%	198
31.	UGA Uganda	876866	78918	9%	797948	91%	508582	58%	289366	36%	199
32.	MAL Malawi	417813	33425	8%	384388	92%	338428	81%	45960	12%	198
33.	MAS Mauritius	19053	1143	6%	17910	94%	15814	83%	2096	12%	198
34.	TAN Tanzania	1234259	74055	6%	1160204	94%	1086148	88%	74056	6%	198
35.	GAM Gambia	34205	1369	4%	32836	96%	...	..	...	..	198
36.	NIE Nigeria	4635053	185402	4%	4449651	96%	2502928	54%	1946723	44%	199
37.	SWZ Swaziland	32664	1306	4%	31358	96%	27764	85%	3594	11%	198
38.	BUU Burundi	228489	6854	3%	221635	97%	171366	75%	50269	23%	199
39.	CAV Cape Verde	14441	433	3%	14008	97%	11409	79%	2599	19%	199
40.	GUB Guinea-Bissau	35187	704	2%	34483	98%	21112	60%	13371	39%	198
41.	SEY Seychelles	1777	36	2%	1741	98%	1582	89%	159	9%	199
42.	SIL Sierra Leone	170111	3402	2%	166709	98%	127584	75%	39125	23%	199
43.	ALG Algeria	818868	8189	1%	810679	99%	679660	83%	131019	16%	199
44.	BFA Burkina Faso	367507	...	..	...	..	147003	40%	...	..	198
45.	CNG Congo	97373	...	..	...	..	...	..	...	..	198
46.	REU Reunion	13164	...	..	...	..	...	..	...	..	198
47.	SAH St Helena	104	...	..	...	..	...	..	...	..	198
AFR Africa Region		21335625	6006600	28%	15329025	72%	10782314	51%	4546711	30%	

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APPENDIX 3c

Ranked Annual Drop out Rates

Region: Africa
Latest data available in 1991

Ranked on BCG - Measles Dropout rate

Rank	Location	Survivors	No Access Diff Out		BCG < 1 Doses Cov		Measles < 1 Doses Cov		BCG - Meas Dropout Diff Out	Year of dat	
1.	MAD Madagascar	481362	110713	23%	370649	77%	149222	31%	221427	60%	198
2.	GUI Guinea	251290	208571	83%	42719	17%	17590	7%	25129	59%	198
3.	MAU Mauritania	81963	18851	23%	63112	77%	26228	32%	36884	58%	198
4.	NIG Niger	346533	187128	54%	159405	46%	72772	21%	86633	54%	199
5.	CHA Chad	216642	142983	66%	73659	34%	36829	17%	36830	50%	198
6.	MAI Mali	391638	133157	34%	258481	66%	133157	34%	125324	48%	199
7.	ETH Ethiopia	2078893	1455225	70%	623668	30%	332623	16%	291045	47%	198
8.	CAE Cameroon	509933	377350	74%	132583	26%	71391	14%	61192	46%	198
9.	NIE Nigeria	4635053	185402	4%	4449651	96%	2502928	54%	1946723	44%	199
10.	BEN Benin	207457	109952	53%	97505	47%	56014	27%	41491	43%	198
11.	TOG Togo	143284	38687	27%	104597	73%	60180	42%	44417	42%	198
12.	GUB Guinea-Bissau	35187	704	2%	34483	98%	21112	60%	13371	39%	198
13.	UGA Uganda	876866	78918	9%	797948	91%	508582	58%	289366	36%	199
14.	GAB Gabon	43210	4321	10%	38889	90%	28519	66%	10370	27%	198
15.	SEN Senegal	300118	36015	12%	264103	88%	192075	64%	72028	27%	198
16.	GHA Ghana	604159	114791	19%	489368	81%	362495	60%	126873	26%	199
17.	SOA South Africa	1041991	156299	15%	885692	85%	656454	63%	229238	26%	199
18.	ZAI Zaire	1486684	609540	41%	877144	59%	654141	44%	223003	25%	198
19.	ZAM Zambia	395624	87038	22%	308586	78%	233418	59%	75168	24%	198
20.	BUU Burundi	228489	6854	3%	221635	97%	171366	75%	50269	23%	199
21.	SIL Sierra Leone	170111	3402	2%	166709	98%	127584	75%	39125	23%	199
22.	COM Comoros	23587	2123	9%	21464	91%	16747	71%	4717	22%	198
23.	STP Sao Tome & Prin	3790	454	12%	3336	88%	2616	69%	720	22%	198
24.	ANG Angola	407506	215978	53%	191528	47%	154853	38%	36675	19%	199
25.	CAV Cape Verde	14441	433	3%	14008	97%	11409	79%	2599	19%	199
26.	KEN Kenya	1051759	210352	20%	841407	80%	683643	65%	157764	19%	198
27.	RWA Rwanda	323178	35550	11%	287628	89%	239151	74%	48477	17%	198
28.	ALG Algeria	818868	8189	1%	810679	99%	679660	83%	131019	16%	199
29.	NAM Namibia	68398	6839	10%	61559	90%	52666	77%	8893	14%	198
30.	ZIM Zimbabwe	372126	55818	15%	316308	85%	271652	73%	44656	14%	198
31.	IVC Cote d'Ivoire	542609	330992	61%	211617	39%	184487	34%	27130	13%	198
32.	MAL Malawi	417813	33425	8%	384388	92%	338428	81%	45960	12%	198
33.	MAS Mauritius	19053	1143	6%	17910	94%	15814	83%	2096	12%	198
34.	LES Lesotho	65030	13656	21%	51374	79%	45521	70%	5853	11%	198
35.	SWZ Swaziland	32664	1306	4%	31358	96%	27764	85%	3594	11%	198
36.	MOZ Mozambique	601344	306685	51%	294659	49%	264591	44%	30068	10%	198
37.	SEY Seychelles	1777	36	2%	1741	98%	1582	89%	159	9%	199
38.	TAN Tanzania	1234779	74055	6%	1160204	94%	1086148	88%	74056	6%	198
39.	BOT Botswana	56495	22033	39%	34462	61%	33897	60%	565	2%	198
40.	LIB Liberia	104652	61745	59%	42907	41%	41861	40%	1046	2%	198
41.	BFA Burkina Faso	367507	...	...	...	...	147003	40%	...	...	198
42.	CNG Congo	97373	...	...	...	...	...	...	...	...	198
43.	EQG Equat. Guinea	13542	9751	72%	3791	28%	...	...	...	...	198
44.	GAM Gambia	34205	1369	4%	32836	96%	...	...	...	...	198
45.	REU Reunion	13164	...	...	...	...	...	...	...	...	198
46.	SAH St Helena	104	...	...	...	...	...	...	...	...	198
47.	CAF Cen. Afr. Rep.	123894	70619	57%	53275	43%	68141	55%	-14866	-28%	198
AFR Africa Region		21335625	6006600	28%	15329025	72%	10782314	51%	4546711	30%	

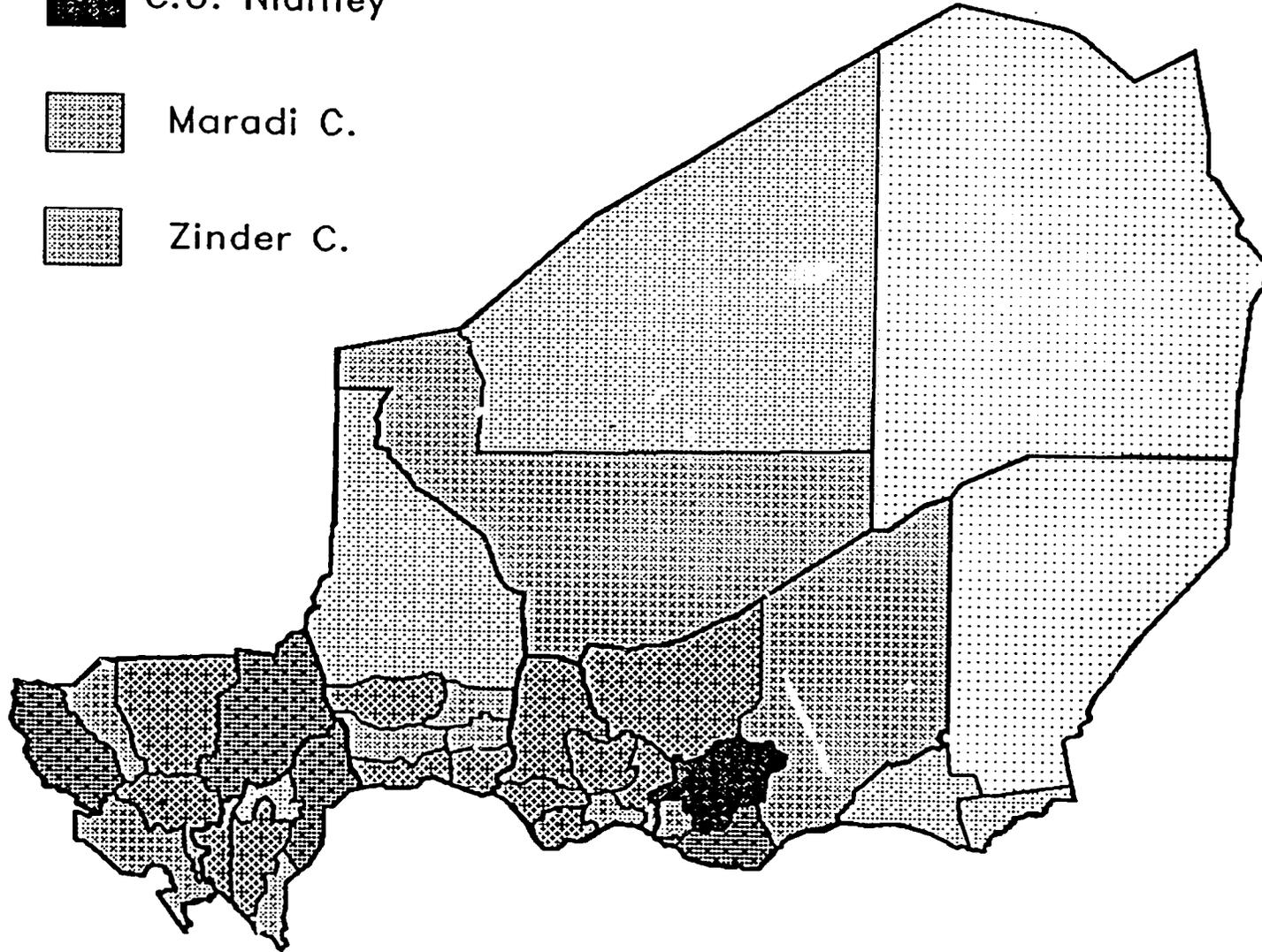
POPULATION TOTALE MI - 1990

NIGER, PAR ARRONDISSEMENT

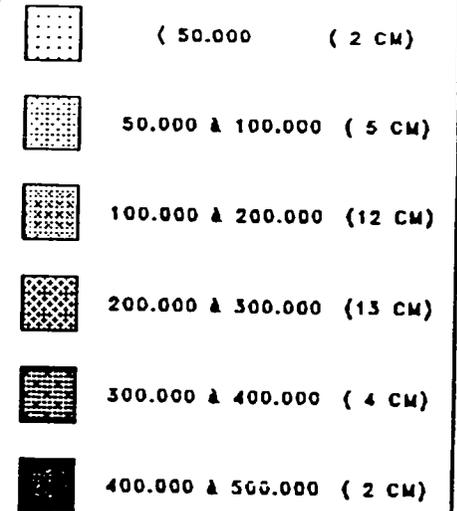
 C.U. Niamey

 Maradi C.

 Zinder C.



POPULATION MI-1990

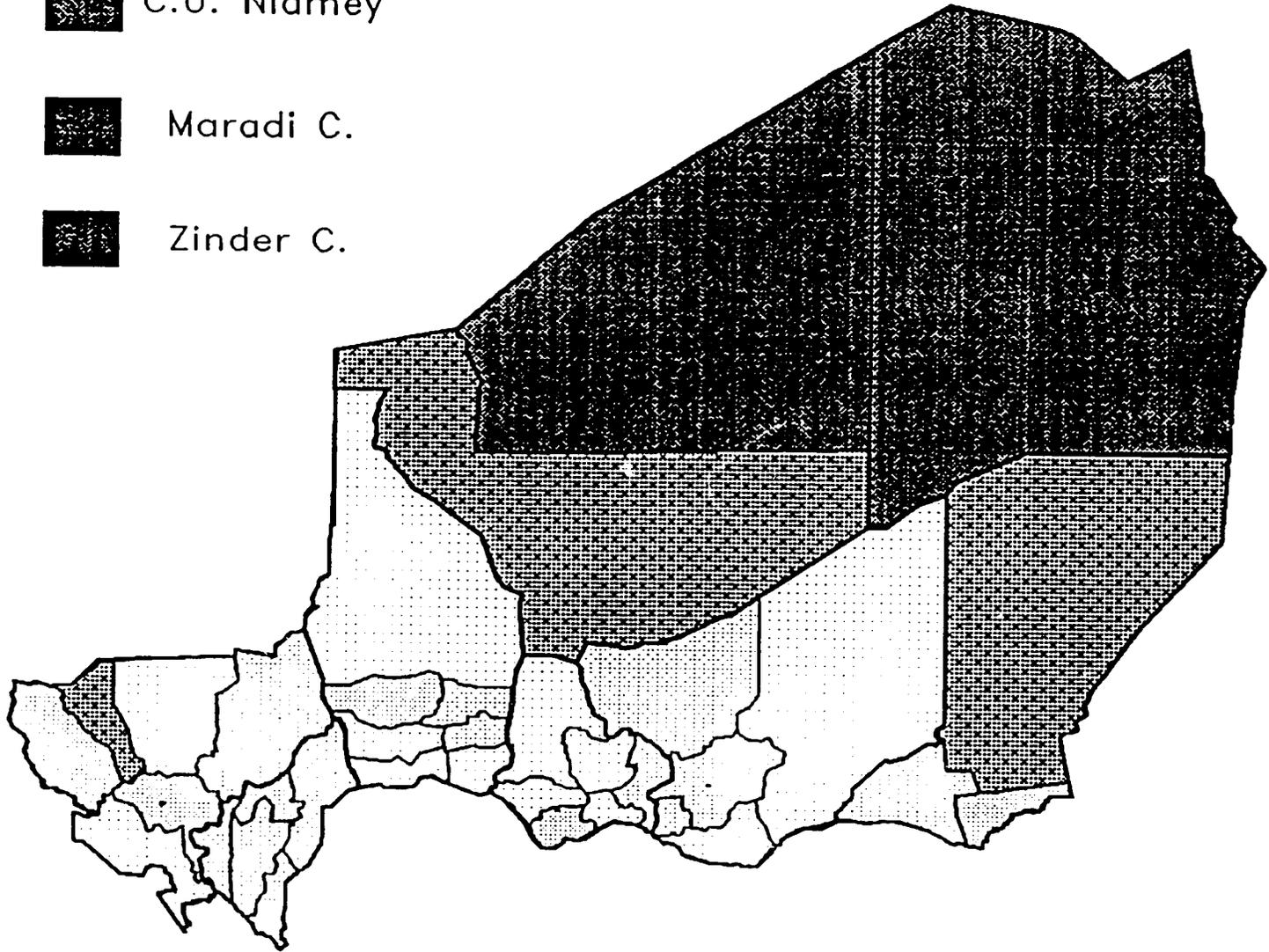


Population Nationale
Mi - 1990:
7.784.400

Source:
MSP/DEP SNIS

COUVERTURE SANITAIRE - FORMATIONS FIXES DANS UN RAYON DE 5 KM, 1990 (1)

-  C.U. Niamey
-  Maradi C.
-  Zinder C.



COUVERTURE SANITAIRE

	10 à 20 %	(12 CM)
	20 à 30 %	(12 CM)
	30 à 40 %	(6 CM)
	40 à 50 %	(0 CM)
	50 à 60 %	(3 CM)
	> 60 %	(5 CM)

(1)

Population < 5 km des FS
(RMS2, SNIS, 1990)

Population Totale Mi-1990

Total Population < 5 km
des FS: 2.436.900

Population Totale
mi-1990: 7.784.400

Couverture Nationale: 31,3%

Source:
MSP/DEP SNIS

COUVERTURE VACCINALE 1990

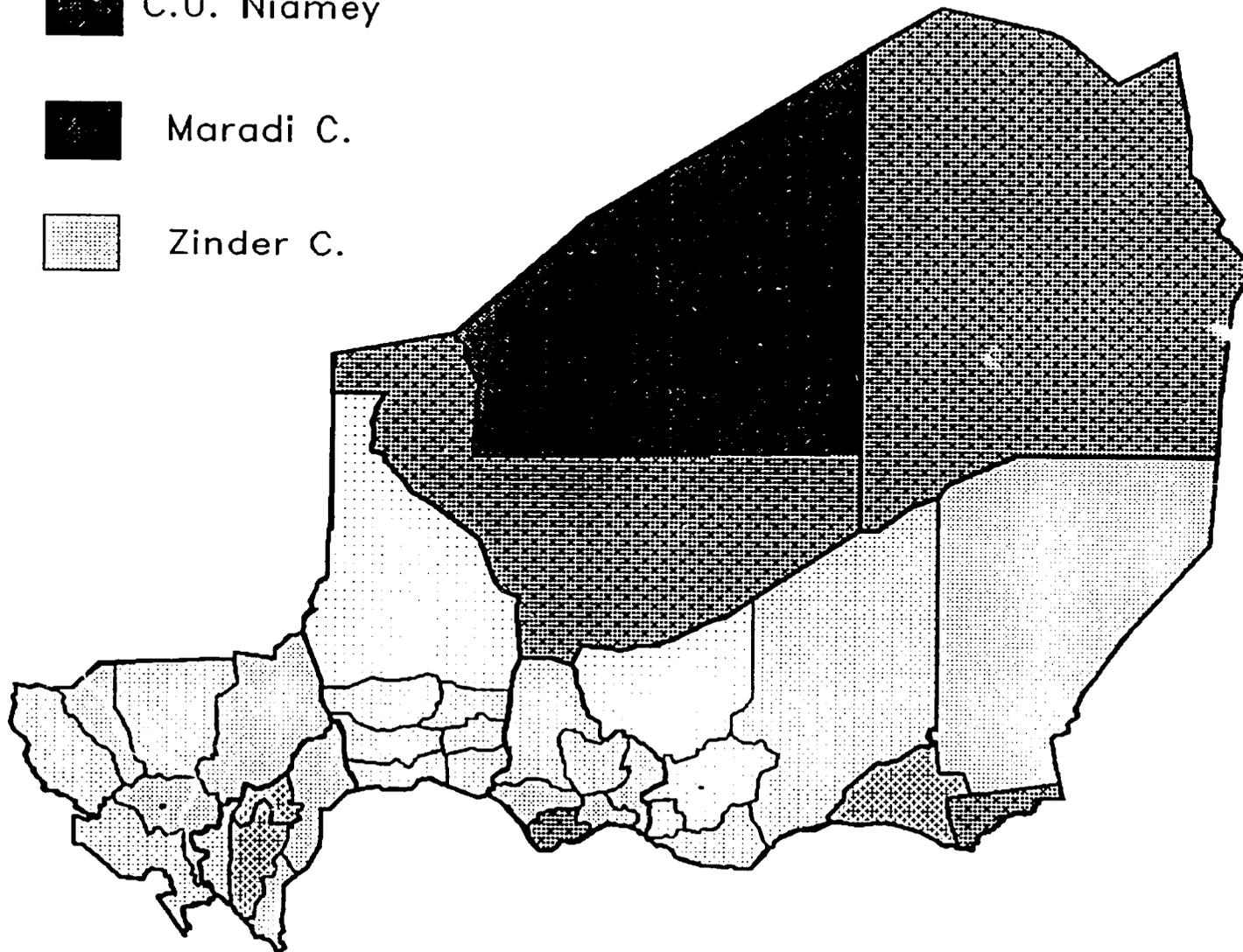
ANTIGEN: BCG

POPULATION CIBLE: TOUS ENFANTS < 1 AN

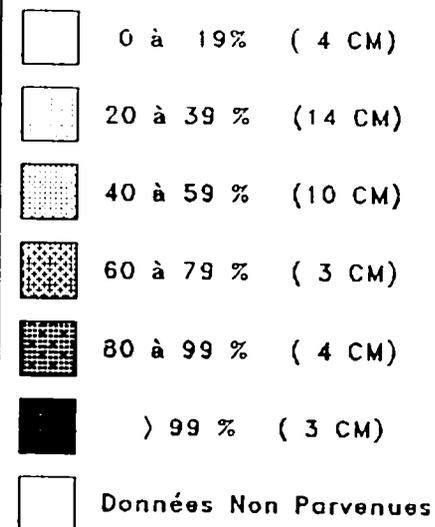
 C.U. Niamey

 Maradi C.

 Zinder C.



TAUX (*)



* $\frac{\text{NOMBRE DE DOSES}}{\text{TOTAL POP. < 1 AN}}$ %

Source:
MSP/DEP-DNPEV/ SNIS

Date: 11/09/91

Fichier: BCG_90AN.DBF

COUVERTURE VACCINALE 1990

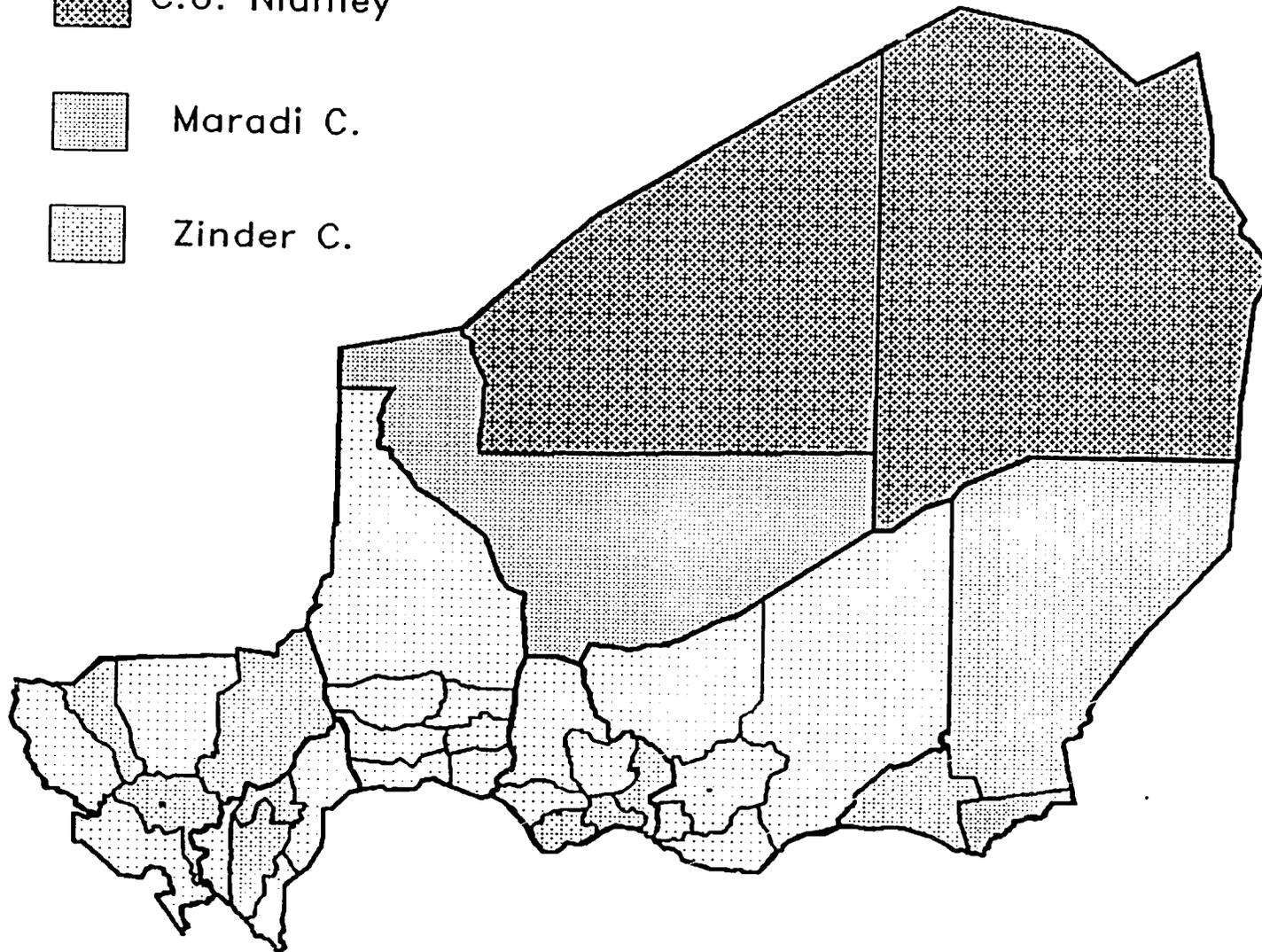
ANTIGEN: ROUGEOLE

POPULATION CIBLE: TOUS ENFANTS < 1 AN

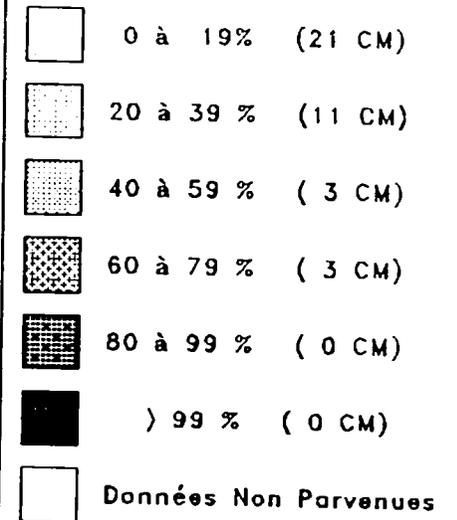
 C.U. Niamey

 Maradi C.

 Zinder C.



TAUX (*)



$$* \frac{\text{NOMBRE DE DOSES}}{\text{TOTAL POP. < 1 AN}} \%$$

Source:
MSP/DEP-DNPEV /SNIS

Date: 11/09/91

Fichier: ROUG90AN.DBF

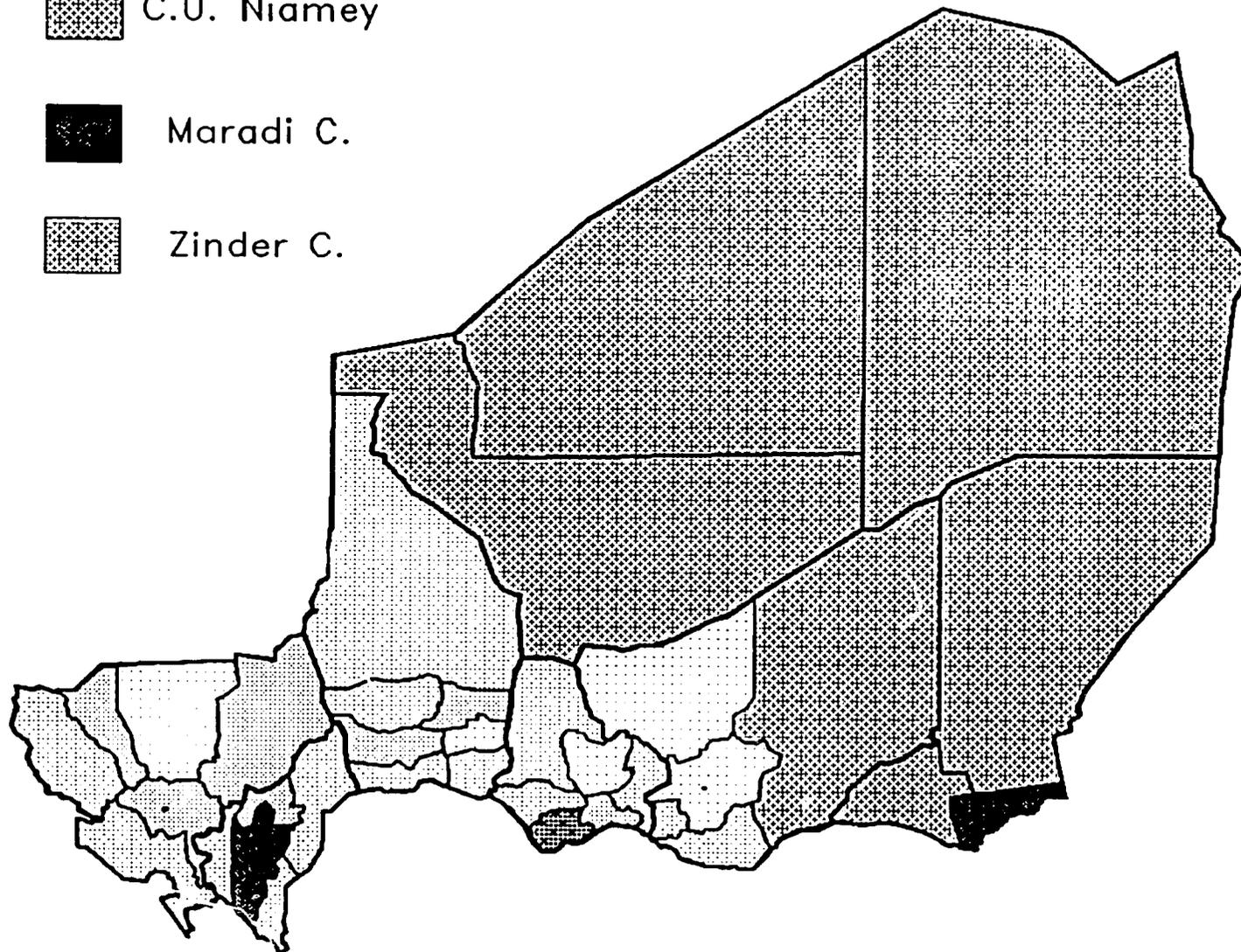
COUVERTURE VACCINALE 1990

ANTIGEN: VAT1 POPULATION CIBLE: TOUTES FEMMES DE 15 A 45 ANS

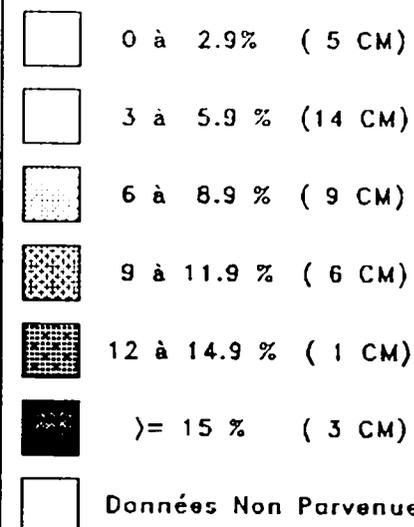
 C.U. Niamey

 Maradi C.

 Zinder C.



TAUX (*)



* $\frac{\text{NOMBRE DE DOSES}}{\text{TOTAL FEMMES 15 A 45 ANS}} \%$

Source:
MSP/DEP-DNPEV /SNIS

Date: 11/09/91

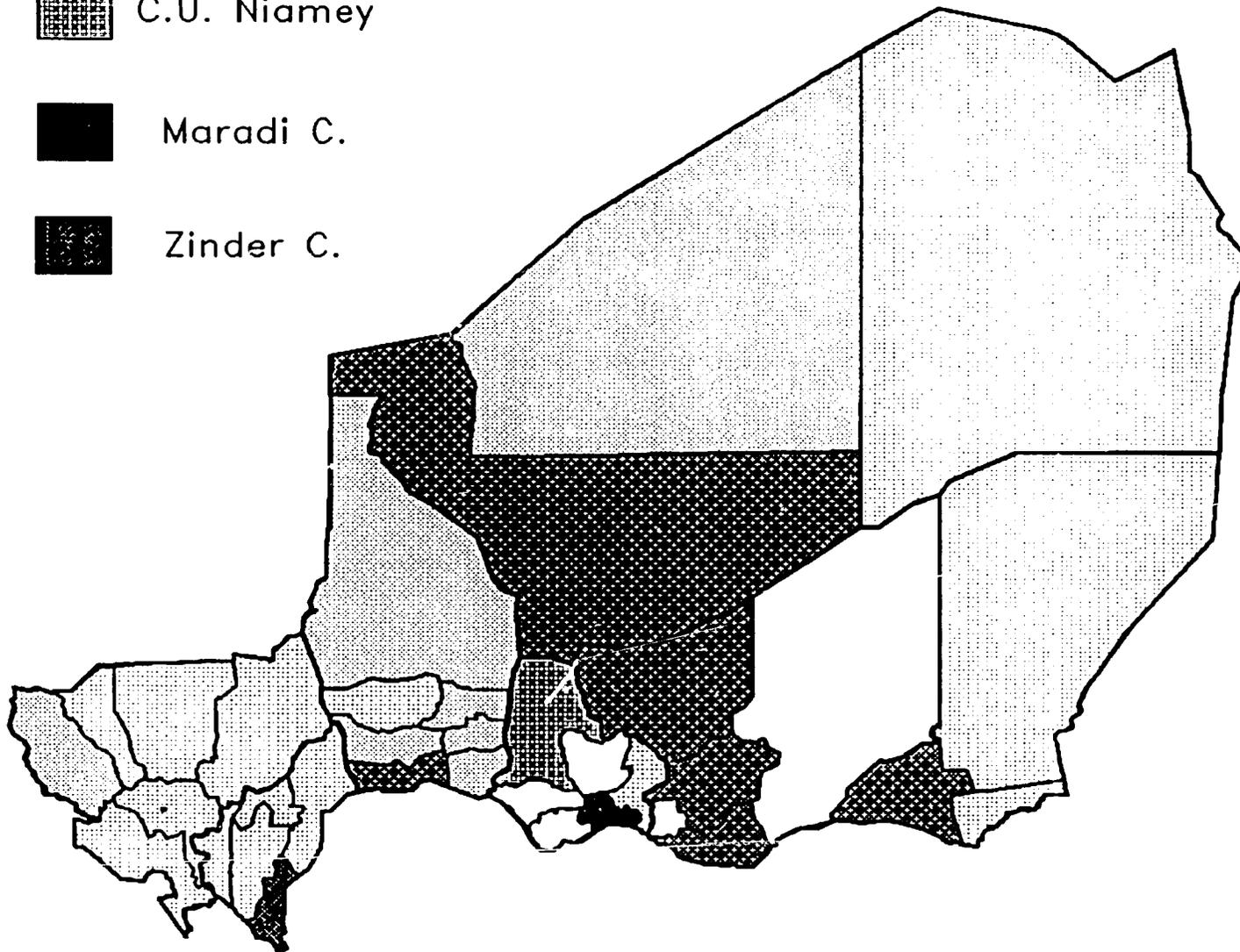
Fichier: VAT190AN.DBF

TAUX DE ROUGEOLE, < 1 AN, 1990 NIGER, PAR ARRONDISSEMENT

 C.U. Niamey

 Maradi C.

 Zinder C.



ROUGEOLE, < 1 AN

 0 à 2 (14 CM)

 2 à 4 (7 CM)

 4 à 6 (2 CM)

 6 à 8 (5 CM)

 8 à 10 (2 CM)

 > 10 (2 CM)

 Données Non Parvenues

Taux National: 3.82 %

Données Non Parvenues
des CM Suivantes:

Guidan-Roundji
Madarounfa
Mayahi
Goure
Matameye

et de la DDS Tillabéri
pour le 1er Trimestre.

Source:

MSP/DEP SNIS

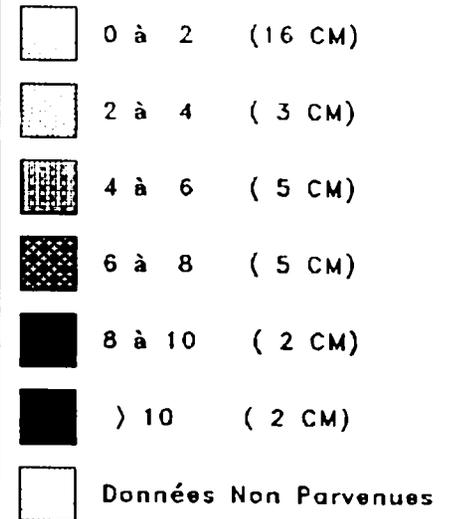
TAUX DE ROUGEOLE, < 5 ANS, 1990 NIGER, PAR ARRONDISSEMENT

C.U. Niamey

Maradi C.

Zinder C.

ROUGEOLE, < 5 ANS



Taux National: 3.55 %

Données Non Parvenues
des CM Suivantes:

Guidan-Roumdji
Madarounfa
Mayahi
Goure
Matameye

et de la DDS Tillabéri
pour le 1er Trimestre.

Source:

MSP/DEP SNIS

