



Partnership for Reviving Routine  
Immunisation in Northern Nigeria;  
Maternal Newborn and Child Health Initiative

## An Update on the Nahuče Health and Demographic Surveillance System

By: Henry V. Doctor, Operations Research Advisor, PRRINN-MNCH Programme, Kano

### Background

In 2009, the PRRINN-MNCH Programme through funding from the Norwegian Government, set up the Nahuče Health and Demographic Surveillance System (HDSS), a longitudinal health and population registration system established to monitor health and demographic dynamics in Nahuče emirate in Bungudu Local Government Area (LGA) of Zamfara State. The Nahuče HDSS has been implemented by the PRRINN-MNCH Programme in collaboration with the Zamfara State Ministry of Health to support studies aimed at assessing the wider progress and impact of strengthening health systems by monitoring health and demographic events and populations at risk over time.

The Nahuče HDSS site is 32 kilometres from the state capital, Gusau, and is constituted of six districts: Bella, Gada, Karakai, Nahuče Keku, Nahuče Ubandawaki and Rawayya. Virtually all members in the study area are Hausa by ethnicity. The study site contains 306 villages under the leadership of six district heads. Infrastructure remains substandard with limited power supply in the area. The sanitation system is not well developed and the water supply through boreholes or wells is erratic. The road network is bad with local taxis being the predominant means of transport. All villages have at least a primary and junior secondary school. Farming is the most common economic and subsistence activity of the people, hence the

slogan of the state "farming is our pride." High unemployment contributes to temporary labour migration of men.

The key objectives of Nahuče HDSS are to:

- (a) monitor health and population changes;
- (b) study interlinkages between Maternal Newborn and Child Health service strategies and survival, and
- (c) monitor and evaluate the impact of health and livelihood intervention programmes.

### Implementation activities during 2009-2010

A number of activities were completed during 2009-2010 such as:

- (a) the site appraisal by consultants from the INDEPTH Network (Ghana);
- (b) establishing a steering committee for the HDSS;
- (c) recruitment and training of field and data entry staff;
- (d) Procurement and installation of IT equipment, VSAT for internet, and power supply facilities.
- (e) mapping, compound listing and household numbering;
- (f) pilot census activities to test data collection and computing systems; and
- (g) a full baseline census for all the six districts of the HDSS.

## The full baseline census

The baseline census was conducted between September and December 2010 (Round 0). The target population was 95,000 people based on the 2010 estimates from the National Population Commission. The HDSS sought a population large enough to detect events such as neonatal deaths within short intervals of time. The baseline census questionnaire collected information on names of household members, relationship to head of household, residence status, sex, date of birth, ethnicity, marital status, education, survival status of parents and household characteristics. The fieldworkers interviewed the head of the household or a responsible adult. A maximum of three revisits were carried out, following which a non-response was recorded. Beginning in January 2011, trained interviewers will be visiting compounds within the HDSS site in 120-day work cycles, recording events in registers, and reporting data to the Nahucho HDSS computer center for processing.

Within the HDSS structure, compounds or dwelling units (DUs) were grouped into clusters. This will provide an important opportunity to deploy selected interventions within selected clusters to allow for comparison. The cluster approach also enables fieldworkers to complete the enumeration rapidly and submit the completed forms to the computer center for processing. Worldwide, the number of DUs per cluster in HDSS sites varies. It is based on what is subjectively considered manageable. As a result, the 100 demarcated clusters were different in terms of size and number of compounds or DUs. A total of 8,152 compounds were registered in these clusters and the target was to visit all of the identified households in all of the clusters.

### *Household population and characteristics (preliminary results from unedited data)*

The Nahucho HDSS enumerated a baseline population of 124,864 in 19,154 households. A majority of the households were in Gada (21.0%)

followed by Rawayya (20.0%), Bella (18.2%), Nahucho Keku (15.8%), Nahucho Ubandawaki (13.8%) and Karakai (11.2%). The average number of persons per household was 6.5 ranging from 5.6 in Karakai to 6.9 each in Nahucho Ubandawaki and Rawayya.

Age and sex are important demographic characteristics. They form the basis of demographic classification and are also key variables in the study of mortality, fertility, migration and nuptiality. The distribution of the de jure (usual residents) population in the 2010 baseline census is presented in Table 1. About half (49.9%) of the population was female, representing a sex ratio (males/100 females) of almost unity. The results show that the household population had a greater number of younger people than older people (see summary in Figure 1). About 51% of the total population was under 15 years of age while 3% was 65 years or older. The average age was 19.6 years.

**Table 1:** Selected characteristics of 124,864 individuals, Nahucho baseline census, 2010

Characteristics	Number
De jure population size <sup>a</sup>	124,864
Male	62,615
Female	62,249
Ratio male to female	1.01
Number of households	19,154
Mean household size <sup>b</sup>	6.5
% under five years	20.4
% under 15 years	50.9
% 65+ years	3.0
Mean age (years) <sup>c</sup>	19.6
Median age (years)	14.0

Notes: <sup>a</sup>De jure population: the permanent population plus temporary migrants. These are people who usually stay in the household for 3 or more months each year. <sup>b</sup>Based on de jure population. <sup>c</sup>Minimum age in years is 0 and maximum is 110.

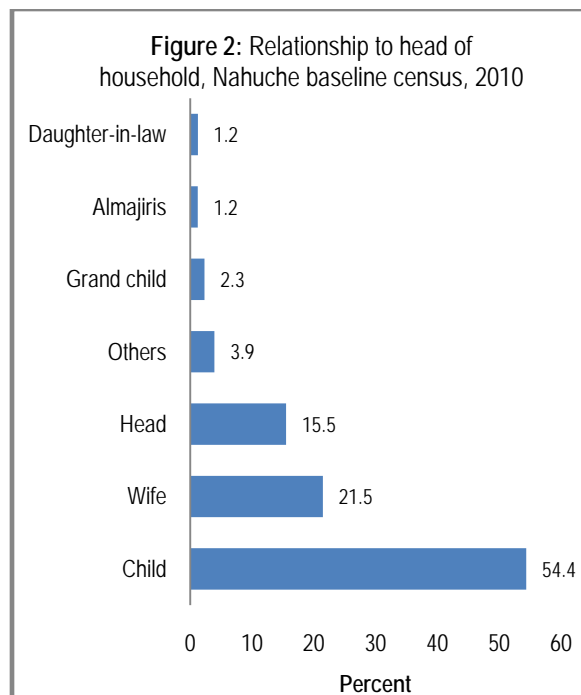
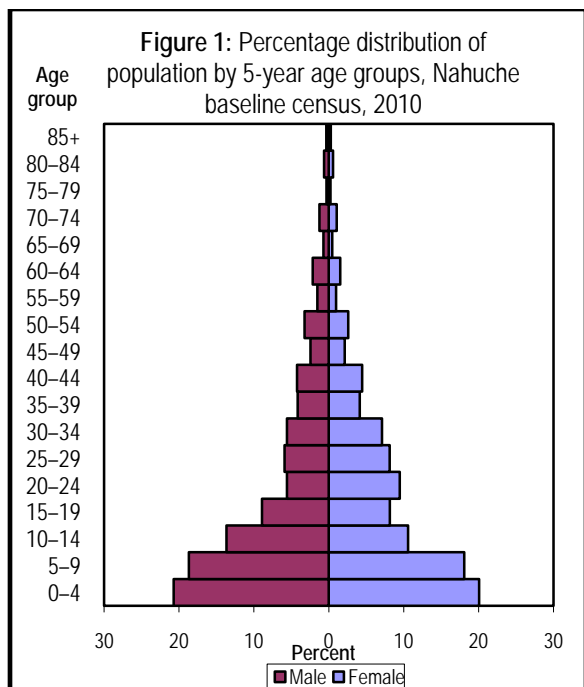


Figure 2 displays the relationship to the head of the household of all the members enumerated in the 19,154 households. The predominant relationship was that of a child representing 54.4% of the household members followed by 21.5% of the members who were wives to the head. These households were headed by 15.5% of the de jure population with 3.9% classified as “other” relationships. Another 2.3% of the household members were residing with grandchildren and 1.2% being *Almajiris*, that is, children who are taught the Islamic religion. The *Almajiris* are known to come from as far as Niger Republic. A similar percentage of households were staying with daughter-in-laws.

### Socioeconomic conditions

The baseline census collected information on a number of household possessions in form of durable goods and other assets as well as livestock. This information (see Table 2) is important since it provides an indicator of the wealth status of the household. The results show that few households owned some of the more expensive assets compared with the less expensive assets. For example, 38.2% of the households owned a bicycle, followed by a motorcycle (29.6%), television (11.3%), a refrigerator (3.3%), a motor vehicle (2.8%), a satellite dish for television (0.7%), a computer (0.3%) and a tractor (0.2%). A majority of the households possessed a hoe (98.2%), a mattress (95.3%), and a cutlass (87.0%).

**Table 2:** Percentage distribution of households (n=19,154) by possession or access to selected goods, Nahucho HDSS baseline census, 2010

Assets	Percent
Hoe	98.2
Torch	96.9
Mattress	95.3
Clock/Watch	90.5
Cutlass	87.0
Kerosene/Paraffin lamp with glass	85.6
Radio/Stereo	71.7
Table	63.2
Sofa set	57.2
Access to pay phone/Mobile	54.2
Mobile phone	40.6
Bicycle	38.2
Kerosene/Paraffin stove	34.9
Electricity	30.5
Motorcycle	29.6
Electric/Charcoal iron	20.6
Electric fan	13.7
Television	11.3
Video deck/DVD player	10.9
Gas stove	6.9
Refrigerator	3.3
Motor vehicle	2.8
Satellite dish/receiver	0.7
Computer	0.3
Tractor	0.2

### Conclusion

The Nahucho HDSS will monitor longitudinal health and demographic dynamics under exceedingly complex circumstances. Cultural factors restrain married women from being interviewed by men, low levels of educational attainment result in largely male-dominated fieldworker teams, and age distortions and other biases occur in the recall of information. Despite these essential difficulties, information was and will be recorded, edited and reported on population dynamics in a large population.

Findings from the baseline census showed a largely young population. The successful replication of surveillance technology in an impoverished northern Nigerian population

provides the opportunity to study the determinants of poor maternal and child health behaviours, and generates realistic interventions to address health problems in such settings. The Nahucho HDSS baseline census activities have demonstrated the replication of surveillance technology in a resource-constrained environment and become a model for other longitudinal health and demographic research projects in Nigeria. Nahucho has not only replicated a capacity for conducting longitudinal research; it has developed a platform for testing feasible interventions as we draw closer to the Millennium Development Goals.

### *Selected photographs from Nahucho HDSS*



*Nahucho HDSS computer centre staff entering baseline census data.*



*Nahucho HDSS social mobilization committee meeting in progress.*