The Nouna Health District Household Survey
Design and Implementation

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Abstract

The success of health economics and its guidance for health policy rely heavily on the availability of reliable empirical evidence on the demographic, economic and epidemiological environment, on behavioral relationships, and on the impact of policy interventions. For developing countries, especially the epidemiological situation is unclear, since comprehensive systems of mortality and health statistics are often absent. This paper describes the design and implementation of a household survey comprising health as well as economic circumstances. This survey has been launched as a panel of 800 households in July 2000 in a health district of a rural and semi-urban area in the North-West of Burkina Faso. In this presentation, special emphasis is put on the selection of the study population, the survey design, the field procedures, and the data management. Since the survey is designed as a multi-topic survey, the design of the questionnaire is the key aspect of the paper. It is suggested as a frame of reference for future surveys combining epidemiological and economic aspects.

Keywords: survey methodology, health survey, household survey, panel, survey design, questionnaire design, sampling, field procedures, morbidity data, demographic surveillance system.

1. Introduction

The success of health economics and its guidance for health policy rely heavily on the availability of reliable empirical evidence on the demographic, economic and epidemiological environment, on behavioral relationships, and on the impact of policy interventions. For developing countries, especially the epidemiological situation is usually unclear, since comprehensive systems of mortality and health statistics are often absent [Cooper et al. (1998)]. There is a growing literature on this issue [see for example Korn and Graubard (1999) and Aday (1996)], indicating the increasing demand for health surveys in academia and politics. The World Bank is continuously conducting and analyzing surveys, especially in the developing world [Grosh and Glewwe (1995)]. But to our knowledge, there are no surveys that – like the survey presented in this paper – simultaneously comprise extensive data on socio-economic status, a variety of questions on health issues (demand for health care, treatment choice, costs, and quality), and a detailed record of epidemiological data (morbidity by cause).

Very few mortality data are available for sub-Saharan Africa (SSA). The primary sources of information are model-based extrapolations and national statistics [Murray and Lopez (1996), WHO (1998)]. Unfortunately, the latter either report hospital statistics which are most probably subject to severe underreporting, since in SSA large shares of the population have no access to hospital care, or the reported statistics are essentially just informed guesses [Kaufman et al. (1997)]. In addition, there is only a small number of population laboratories that provide information on mortality, usually for a rather small geographically well-defined area [see for example INDEPTH (2001), Würthwein et al. (2001), or Kelly et al. (1998)]. This situation is still worse for morbidity data for SSA. Clinical morbidity data threaten to be even more strongly biased than clinical mortality data (since the population seeks hospital treatment only for some severe diseases) and even less data collection has been accomplished thereupon.

The purpose of this paper is to provide a thorough description of the *Nouna Health District Household Survey* (NHDHS) with particular emphasis on its design and implementation. Moreover, the paper discusses the survey design in a theoretical context, whereby the NHDHS itself can be seen as an example for the development and implementation of a health survey that at the same time has a strong socio-economic focus. As such, the paper offers both a frame of reference for analysts of the NHDHS and suggests a procedure to be followed in future surveys combining economic and epidemiological data.

The NHDHS is collected by the *Nouna Health Research Center* (*Centre de Recherche en Santé de Nouna, CRSN*), a research institution that is directly subordinated to the *Secretary General of the Ministry of Health of Burkina Faso.* The survey's principal objective is the support of a rational and effective health policy not only in the *Nouna Health District* itself, but also on the level of Burkina Faso as a whole. It aims to develop an institutionalized system for the measurement of population-based morbidity data and at the same time extensively collects complementary socio-economic information. These data thus provide the opportunity for the analysis of behavioral relationships as well as for the construction of predictors for the *Burden of Disease*, in both absolute levels and by cause. It can thus serve as a basis for conditional projections of the disease burden for other regions of SSA, where typically data provide information only on the socio-economic status, hygiene and/or nutrition.

One of the initial decisions in the design of such a survey is whether to concentrate on a few topics in depth or to create a multi-topic survey. The latter enables the researcher to analyze issues of health and economic questions in a multivariate approach but gives up on detail in each dimension. It aren't only the direct costs of the survey which impose limits on the possible combinations of depth and breadth of the questionnaire, though. The longer an interview takes to complete, the larger the requirements on the respondent's time and ability to concentrate. Thus, a more comprehensive survey is necessarily prone to greater measurement error, limiting the amount of information that can be collected with this instrument.

Within the limits on the overall size of the questionnaire that are dictated by the above considerations and by the available budget, the NHDHS follows the *Living Standard Measurement Studies* (LSMS) of the World Bank in collecting a multi-topic survey at the expense of the necessary simplicity in each aspect [Grootaert (1986)]. Whereas the LSMS surveys focus on the assessment of socio-economic data, the NHDHS places special emphasis on the collection of health and morbidity data. This emphasis made a strict limitation of the other sections of the questionnaire unavoidable. Furthermore, it implied that much of the preparatory work comprised the search for a set of survey questions which are as revealing about the respective topics as possible. Ultimately, the NHDHS collects information on housing and hygiene, income and expenditures, food and nutrition, and health and health care. Additionally, information on demographics, education and occupation are imported from a demographic surveillance system.

The paper is organized as follows. While the second section concentrates on questions of survey design, such as sampling and the time frame of the survey, section 3 addresses practical aspects, for instance the interviewer training or the sensitization of the respondents. Section 4 introduces the questionnaire in detail, and section 5 concludes with an outlook on further research.

2. Survey Design

2.1 Study Population And Institutional Background

Burkina Faso is inhabited by an estimated population of approximately 11 million people [World Bank (2000)]. This West African state is divided into 11 administrative health regions, which comprise 53 health districts overall, each covering a population of 200 to 300 thousand individuals. At least one health care facility in each district is a hospital with surgery capacities [Burkina Faso Ministry of Health (1996)]. The districts themselves are again sub-divided into smaller areas of responsibility which are organized around either a hospital or a so-called CSPS (*Centre de Santé et de Promotion Sociale*), the basic health care facility in the Burkinian health system.

The Nouna health district, identical to the province of Kossi, covers 16 CSPS, one district hospital and a population of roughly 230 thousand inhabitants [Burkina Faso Ministry of Health (1998)]. The province of Kossi is located in the North-West of Burkina Faso, some 300km from the capital Ouagadougou. The area is a dry orchard Savannah, populated mostly by subsistence farmers of different ethnic groups. It has a sub-sahelian climate with a mean annual rainfall of 796mm (range 483-1083mm) over the past five decades [Yé et al. (2001)].

Since the early 1990's a collaborative research and health policy project of the Ministry of Health of Burkina Faso and the University of Heidelberg has been undertaken under the name PRAPASS (*Projet de Recherche-Action pour l'Amélioration des Soins de Santé*). In 1999, the Government of Burkina Faso institutionalized this project, creating the Nouna Health Research Center (CRSN), which was linked directly to the Secretary General and endowed with substantial human and infrastructure resources. The CRSN serves as a platform for interdisciplinary research in the fields of public health, health economics, epidemiology, parasitology, and entomology.

In 1992, a *demographic surveillance system* (DSS) was implemented, starting with a first census that covered the population of 39 villages (the former catchment area of three CSPS), the mid-year population of 1998 being 31,280 inhabitants. The first census was supplemented by a *vital events registration* system recording births, deaths and migration, and updated via two control censuses in 1993 and 1998. In January 2000, the study population was extended to 41 villages (the re-organized catchment area of four CSPS), and the semi-urban town Nouna, the administrative capital of the province of Kossi. The DSS nowadays covers a population of roughly 55,000 inhabitants and serves as the sampling frame of the NHDHS [for more information on the DSS, see INDEPTH (2001)].

2.2 The Modular Questionnaire

In June 2000, a representative sample was drawn from the study population of the DSS. These households will be followed through time, with individual panel waves to be collected at intervals of approximately 3 months.

The survey has a modular structure, allowing the introduction of new modules and the exclusion of existing ones in the course of the study. Currently, five separate questionnaires can be distinguished, each corresponding to a different module:

- The *main questionnaire* collects information on those individual characteristics that can be easily collected in the framework of a household roster (parental relationship, sex, age, ethnic group, religion, education, marital status, occupation, smoking habits, perception of the individual's health state, prevalence of handicap, chronic illness and/or acute illness) and on housing, water supply and sanitation.

- Module 1: the *socio-economic module* gathers information on income and assets of the household, on household expenditures, and on the nutritional status in the household.

- Module 2: the *morbidity module* collects epidemiological data (reported morbidity), and information on the severity of the respective disease, its treatment and the demand for health care thereby initiated. Furthermore the coping strategies of the household with respect to their financial situation and to the household's workload are investigated.

- Module 3: the *module on preventive care and general health* collects data on the use of preventive care and family planning.

- Module 4: the *anthropometric module* assembles the individuals weight and height.

2.3 Time Frame

To capture seasonal variation, all modules of the questionnaire are administered twice a year, once around the peak of the *planting season* (June/July), and once around the peak of the *harvest season* (December/January). Additionally, the morbidity module is administered in autumn (September/October) and spring (March/April). Economically, a usual year in the study area is characterized by a strong cyclical swing in terms of income and even food supply [Sauerborn et al. (1996a)]. During the harvest season, stocks are built up and most of the households experience a time of relative prosperity. But starting from this point in time, food supplies start to decrease and at the onset of the planting season, when the work in the fields resumes, people regularly are short of food and experience a time of hunger at a time of the year when they have to work the hardest [Chen (1991), Moore et al. (1997)].

In addition to the seasonal variation with respect to the economic situation of the population, seasonal variation can also be observed with respect to morbidity and mortality. During the rainy season, there is a high incidence of malaria, the major cause of death in the Nouna health district [Würthwein et al. (2001)]. And in February and March, the prevalence of lower respiratory infections, the third-most frequent cause of death, is exceptionally high because of the dry and relatively cold weather, combined with strong winds and dusty soil. To increase the observation frequency for epidemiological information (some diseases are very rare events), and to capture this seasonal variation, the morbidity module is administered every 3 months.

2.4 Sampling

The NHDHS is a panel survey, i.e. a cross-sectional study repeated over time, surveying the same households chosen as respondents for the initial survey wave. The sample selection procedure is a two-stage cluster sampling, with each household having the same probability of being selected [for details on this sampling method see Levy and Lemeshow (1999)]. In a first stage, clusters of households were selected (7 clusters in Nouna and 20 clusters in the 41 villages), and in a second stage, respondent households were selected in each cluster. No elaborated stratification was applied, since no adequate stratification information was available. The only basic strata used was the distinction between the subset of households resident in Nouna itself and the subset of households residing in one of the 41 villages of the study population. Since the elementary sampling unit is the household, the sample proportions of rural households and Nouna households reflects their respective fractions in the DSS.

	Villages	**Nouna**	**Total**
Households in the DSS	$M_V = 4{,}630$	$M_N = 2{,}802$	$M = 7{,}432$
Fraction of the respective strata	$M_V/M = 62\%$	$M_N/M = 38\%$	100%
Households to be sampled in the respective strata	$m_V = 800 \times 0.6 = 480$	$m_N = 800 \times 0.4 = 320$	

Table 1: *Calculation of sample size in each strata*

The DSS identified M_V = 4,630 households in the 41 villages of the study region, representing a fraction of 62% of all households, and M_N = 2,802 households in Nouna, constituting the remaining 38%. In epidemiological studies, the sample size is often chosen according to a required significance level at which a pre-formulated hypothesis could either be rejected or accepted [Bland (1995)]. Since the NHDHS was not intended to solve one research question alone, we resorted to other considerations. Using existing health surveys and the LSMS studies as a benchmark, the sample was chosen to be representative for the population under study, and sample size was also determined by cost considerations [Tibouti et al. (1993)]. We fixed our sample size to be 800 households, which is roughly 10% of the study population. Compared to the LSMS surveys, this is a rather small sample size. Currently, the smallest LSMS sample size is 800 households in Kagera, Tanzania [see www.worldbank.org/lsms/guide/select.html]. But compared with the study population, a sample of 10% is fairly high and it is not to be expected that the population of the Nouna Health District is extraordinarily heterogeneous, most probably the contrary is the case.

With a sample size of 800 households, m_V = 480 households were sampled in the rural area and m_N = 320 households in the semi-urban area of Nouna. Since the sampling process is slightly different between the rural subset and the Nouna subset, we shall first describe the sampling process of the villages. In the first step of our two-stage cluster sampling, a subset of 18 villages was selected for further sampling. Two numbers *K* (number of clusters) and *L* (cluster size) were chosen such that *K* x *L* = m_V, the number of households that had to be sampled out of the rural subgroup. We fixed *L* to be 24 and thus *K* resulted to be 20. To select the villages, the villages were ordered alphabetically and within each village, the households were ordered sequentially, resulting in a list of the following form:

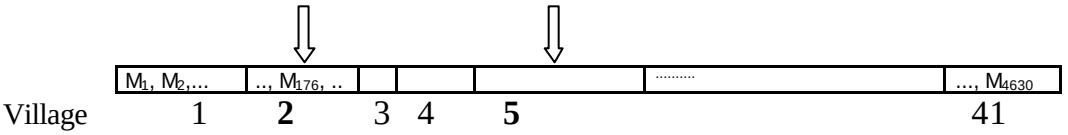

Figure 1: *Selection of sample villages*

Initially, a uniform random number in the interval [1;M_V/K] was generated to determine the starting household. In our case the realization was 176, thus indicating that the household M_{176} was selected. Since household M_{176} resided in village two, the first cluster of households had to be drawn in village two. To identify the next cluster, the fixed length of M_V/K = 231.5 (illustrated by the two arrows in figure 1 above) was added to 176, thereby identifying the next cluster, and so on. In this manner, exactly *K* clusters were chosen. In our case, this procedure resulted in the selection of 18 villages; 3 villages contained 2 clusters and 15 villages contained only one cluster.

To select the households in each village, households were drawn out of an urn in front of the villagers to demonstrate that the selection was a random process and that the respondents of the household survey were not chosen for political reasons or to give a special benefit to some that is withdrawn from others.

In Nouna, the sampling process was much simpler. Nouna is divided into seven administrative town districts. Each of the seven sectors was regarded as one cluster. Because of the resulting big cluster size, each cluster was selected. Out of these 7 clusters we sampled proportionally

to the number of households living there. Again, to demonstrate that the selection was a random process instead of a political selection, the member households of the survey were drawn out of an urn in front of the residents of each sector. For practical reasons, the Nouna sub-sample finally comprised 312 households, and the rural sub-sample consisted of 491 households, resulting in an overall sample size of 803 households altogether.

2.5 The Link To The Demographic Surveillance System

In addition to its role as the sampling frame for the NHDHS, the DSS forms an important partner data base to the NHDHS. Every individual who is surveyed during a wave of the NHDHS is also registered in the DSS. The practical implementation of this requirement is difficult, since the field procedures of the *vital events registration* (VER) of the DSS and the field procedures of the NHDHS are separate endeavors.

The VER takes place every three months. Deaths, births and migrations are registered and in the case of new household members or new households in the study region a few demographic characteristics (sex, kinship, date of birth, marital status, ethnic group, religion) are recorded. Even if the last VER was completed and entered in the data base shortly before a new wave of the NHDHS is collected, it is possible that the composition of a household has changed in the meantime, potentially resulting in discrepancies between the two data bases. To guarantee that the data bases are corresponding, the main questionnaire of the NHDHS is printed out with the information from the DSS already included in the respective fields. Plus, some empty extra lines are added where the required information for new household members can be entered. During the data entry of the completed questionnaires, a special software procedure checks whether the individual has a valid entry in the DSS. If not, the information on the individual has to be updated in the DSS data base.

2.6 Additional Information Outside The Survey

The LSMS surveys typically include additional questionnaires apart from the household questionnaire. Examples in case are community questionnaires, price questionnaires, and questionnaires for health care facilities, schools, and pharmacies [Grosh and Glewwe (1995)]. Beyond doubt, this supplementary information can be crucial for the analysis of specific issues. For example it will be necessary to have information on the prices of crops, livestock and other goods to be able to compute income and wealth variables for the survey households.

In the case of the NHDHS this additional information is largely available outside the original survey. The information on prices, for example, could be collected in separate inquiries. One inexpensive alternative would be to ask so-called key informants, a method that is often used in health surveys in developing countries. Or the information could be extracted from the Burkina Faso price surveys that are delivered by the INSD (*Institut Nationale de la Statistique et la Démographie*), the national statistical office, for all regions of Burkina Faso. As far as information on community facilities (schools, public sanitation, health care facilities, etc.) is concerned, the implementation of a community questionnaire would be redundant in the case of the NHDHS, since the data-collecting research institute is residing in the area and relevant community information is readily available.

Third, we need to know all ongoing health interventions in the study area. Since these might interact with the morbidity situation, it is important to take them into consideration when

analyzing, for example, the determinants of ill-health. The close collaboration with the Nouna health district guarantees, though, that information on such interventions will be available.

3. Practical Aspects And Field Procedures

3.1 Definition Of Some Fundamental Concepts

Practical experience shows that during the data collection stage in the field, theoretically clear-cut concepts like a household or a compound often are a source of confusion [Scott et al. (1980)]. Even the determination of the date of birth can cause difficulties in a setting where only a very small fraction of the population possesses a birth certificate or identity card. Therefore, a clear definition of these basic concepts is imperative.

- A *village* or a *community* is an entity made up of human dwellings and considered as an administrative unit by the political administration.

- A *sector* or a *quarter* is a geographically delimited part of a community or a village. It can either be an administrative unit (in the case of Nouna) or defined as a sector or a quarter by the population itself (in the case of a village). Very often it is populated by a separate ethnic or religious group, and/or geographically detached from the remainder of the village.

- A *compound* is a conglomeration of buildings surrounded or not by a fence, where members of one household or several households live together. In general the inhabitants of a concession are bound by family ties and a head of concession can be defined. In Nouna, however, compounds can also be only spatially grouped buildings, inhabited by several households that are not otherwise linked together.

- The *household* is the basic socio-economic unit within which the various members are related. In general, household members live together in houses or compounds, share their resources and jointly satisfy their needs, under the authority of a *household head*. The members of a household set up a social group with which the individual identifies itself. Usually, household members are bound through family ties, this needn't be always the case, though [for a detailed discussion of the definition of a household see Casley and Lury (1981), or Bender (1967)].

Two types of households can be distinguished: the ordinary household and the institutional household. An *ordinary household* usually consists of a husband, his wife (or his wives in the case of a polygamous household), and their children if they live together with their parents, as well as the parents and servants who live with them. Moreover, it is very common in our study area that foster children belong to the household. An *institutional household* consists of a group of people living together under special conditions. Generally they don't belong to the same family, but they use the same installations which an institution places at their disposal to provide for their essential needs (housing, food, etc.); examples in case are monasteries, boarding schools, or missions. However, in such institutions, one will probably find individuals who live autonomously and separately from the institutional household, and who maintain familial ties. These individuals constitute an ordinary household and are surveyed as such.

Two special cases are: An individual who lives alone in a separate housing, and provides for its fundamental needs alone (such as food, rent, etc.), must be regarded as a separate household. Servants of a household are treated as household members if they don't form a household of their own, according to the rules set out above, and if they sleep and take their meals in the household they are working for.

Generally, one household inhabits one compound, but one compound can be inhabited by several households. Individuals can only be members of a household if they are living near the household, apart from a transitory absence for a shorter period of time. To illustrate this further, two examples are:
1.) The compound No. 002 can be inhabited by members of a household whose household head and other household members are living in compound No. 001, located close to compound 002. In this case, no household will be assigned to compound 002 at all. The inhabitants of compound 002 will be assigned to compound 001.
2.) The compound No. 005, comprising one or several buildings, can be inhabited by the household A and an individual X that doesn't belong to household A but to the household B living in compound No. 006. Thus, the individual X will obviously not be counted as a member of the household A but as a member of the household B.

- The *date of birth* was determined either based on birth certificates (only in a relatively small number of cases), or through comparison with persons of a similar age, where a birth certificate was available, or using a 'local events calendar' which incorporates seasonal landmarks, feasts, political events, and village events (e.g. initiation rites, death of a village headman, famines, etc.) Moreover, there are three different levels of precision: day, month and year are known, month and year are known, or only the year is known or at least estimated.

3.2 Selection, Training and Supervision of the Interviewers

Proficient interviewers are a prerequisite for the successful collection of any survey [Casley and Lurey (1981)]. They are the intermediary between the respondents and the designers and analysts of the survey. The interviewers of the NHDHS have a minimum education of ten years of schooling, and a lot of them already gained experience with former surveys carried out in the area. Additionally, one can confidently assume that they are highly motivated, since the CRSN is one of the major employers in the area of Nouna, offering exceptional career opportunities. Despite their experience, though, further training is indispensable before the survey can be launched.

For the NHDHS, all interviewers received one week of training, directly before the first wave of the survey was launched. A detailed interviewer manual was compiled that describes the objectives of the survey, and the role and the tasks of the interviewers. It also provides some methodological information and a comprehensive explanation of the structure and the contents of the questionnaire and on how to fill it out. Every interviewer was required to read the manual and to keep it as a source of reference during the field work.

Moreover, supervisors accompanied the interviewers during the survey in the field. Interviewers were requested to contact them throughout the data collection period if they had any questions. Since the survey started in the rural area, the interviewers stayed together overnight in the survey villages allowing them to discuss any occurring problems with the supervisors and with each other. The supervisors were permanent staff members of the CRSN.

All of them hold a university degree. Since they were involved in the development of the questionnaire and already have gained experience with other surveys undertaken by the CRSN, they could serve as a competent backup for the interviewers.

3.3 The Pretest

Before the finalization of the questionnaire, a preliminary version was field-tested. Such a pretest is a crucial step in the process of the questionnaire development. It verifies whether the respondent's answers really reveal what the analysts had in mind while designing the questionnaire [Grosh and Munoz (1996)]. To collect different experiences with the questionnaire, ten trained interviewers administered the questionnaire to 30 households outside of the study region (to avoid that the same households might be part of the pretest and subsequently also of the actual household survey).

The interviewers had to write a detailed report on potential problems and inconsistencies, and whether the respondents could understand the questions properly. Furthermore, we instructed the interviewers to specify if respondents were giving answers that would only fit into the "other-categories". Repeatedly given answers of this kind were added as pre-coded answers in the final version of the questionnaire.

3.4 Sensitization of Respondents

In a typical survey, it is the interviewer who establishes the first contact with the household. He is supposed to introduce himself, to explain the objectives of the survey, clarify why this household has been chosen as a respondent household, and to try to create some confidence that the obtained information will be dealt with confidentiality and not be used for tax purposes [Grosh and Munoz (1996)]. For the NHDHS, however, more energy than usual was spent on this crucial task. Firstly, this was done for ethical or cultural reasons. Roughly 90% of the population in the study area are illiterate. Important decisions are often not taken at the level of the household but at community level. Secondly, the NHDHS is part of a longstanding research collaboration. Therefore, a good relationship with the study population is imperative. And thirdly, a thorough sensitization of the study population potentially reduces non-response, dishonesty, and therefore also bias.

In a first step, the authorities (local and province administration) were informed about the planned survey. Subsequently, right before the initial survey of the NHDHS was launched, sensitization meetings were carried out - altogether 36 meetings in the villages and 8 in Nouna. In the villages, a first get-together with the whole village population was arranged to explain the objectives of the survey and to select the respondent households. In a second meeting with the sampled households, the objectives of the survey were explained in more detail, the questions that were going to be asked were clarified and the households were asked for their cooperation. In Nouna, a first sensitization meeting was organized including the political and religious leaders of Nouna and the delegates of the seven town districts and the different churches and religious communities. A second gathering was conducted in the sectors to sample the households and to discuss the survey into more detail.

3.5 Quality Control

The best survey and questionnaire design is useless, if the collected data finally contains a lot of errors. Therefore, different quality control procedures were implemented at the various stages of the survey. During the field phase, the supervisors checked all the questionnaires for completeness and consistency. Generally, in all surveys of the CRSN, a random sample of 5-10% of the households is re-interviewed by a supervisor. On the one hand, this random control procedure is able to detect errors in the questionnaires of the re-interviewed households. On the other hand, it creates a subtle pressure on the interviewers to work cautiously because they never know which interview will be rechecked. For logistic reasons this standard control procedure couldn't be implemented in the first two waves of the NHDHS, but it will be implemented in the future.

During data entry, a system of systematical, mutual control was implemented. In a randomly varying sequence, one data entry clerk checks the work of the other. In addition, the data entry routines contained a set of logical checks which made it impossible to enter e.g. numerical code in alphabetical fields or values that lied outside a pre-defined range. Further consistency checks included the verification of a part of the collected information through the comparison with the DSS data (see also paragraph 2.5 *The Link to the DSS*).

3.6 The Data Base

As mentioned above, there exists a close link between the data base of the DSS and the data base of the NHDHS. Both data bases are written in Microsoft Access. Instead of using a simple spread sheet, a relational data base model was developed, storing the collected information in a set of tables that can be regarded as separate entities with identifiers and attributes. To analyze the data, the relevant tables have to be linked, using either the standard MS Access query procedures or the programming language SQL (Structured Query Language). The requested data can also be extracted from the Access data base and converted to other data formats, like the Stata data file format, plain ASCII or any other imaginable data format, using standard transfer software, e.g. StatTransfer or DBMS Copy.

4. The Questionnaire

Sheatsley [1983] points out that "unlike sampling and data processing, questionnaire design is not a science or technology but remains an art." There are some principles for designing a high-quality questionnaire [Bradburn and Sudman (1991), Ainsworth and van der Gaag (1988)], but the variation of research questions and the cultural and economic environment in which the survey is conducted, make an intimate knowledge of the population under study an important prerequisite for the development of the questionnaire.

Preferably, the questionnaire for a multi-topic survey such as the NHDHS should be designed within a team of experts of different fields and adapted specifically to the particular situation in the study area. The team that developed the NHDHS questionnaire included physicians, public health experts, demographers, economists, anthropologists, and statisticians. Some of the contributors originated from the study area, others had gained experience with surveys in other regions of Africa.

The questionnaire of the NHDHS is included in the Appendix.

4.1 General Remarks

Even if the design of a questionnaire "remains an art", and as such an innovative and creative process, there are some common difficulties that have to be faced, and some rules of thumb that can be followed [Grosh and Glewwe (2000)]:

- *Choice of variables and choice of interview questions.* Naturally, the first important issue in the development of a questionnaire is the specification of the survey variables [Aday (1996)]. If one is only concerned about the quantification of an already specified relationship, it is clear which variables to choose. But if the relationship itself shall be uncovered, we have to allow for some creativity in the assignment of potential determinants. The omission of crucial variables might endanger the successful analysis of a specific problem. On the other hand, supplementary questions are costly - not only in the sense of raising the pecuniary costs but also in raising the respondents burden and fatigue and thus endangering the quality of the responses to the other questions of the questionnaire.

To be able to select the survey variables, one needs to have a clear notion about the research objectives [Peeters (1988)], and a thorough overview of the literature of the respective field [Sheatsley (1983)]. Preferably, the potential analyst(s) of the survey should be included in the development of the questionnaire to prevent that the selection of variables is done on the basis of common sense alone. Knowing the state of the art of the literature prevents the omission of key variables and points to further variables of interest.

Since the NHDHS is designed as a multi-topic survey, we tried to get a crude overview of different topics of the literature on development economics, household economics and health economics and the questionnaire was discussed with researchers familiar with these fields. Additionally, we had a close look at several LSMS questionnaires and the questions and variables they are including [World Bank (1996, 1999), South Africa Labour Development Research Unit (1994)]. We used them as benchmarks, since they are field-tested questionnaires that were already in use for a long time and in many countries, and served as an analytical basis for a variety of different research questions.

The LSMS questionnaires also served as an example on how to get from the variable or concept to the survey question. The most prominent example in this context is "income". Measuring income is much more complex than simply asking "How much do you earn ?" A whole series of questions has to be asked and much accuracy has to be exercised on completely measuring the different sources of income with their respective time horizon (annual, monthly, hourly) and the respective unit of reference (household income, family income, or personal income).

Another concern are questions that potentially lead to non-response or unwillingness to cooperate and respond truthfully. They should be avoided or if they are indispensable, they should at least be asked in the most sensitive way possible.

- *Type of questionnaire*. For the NHDHS, we opted for an interview questionnaire with structured, closed questions and pre-coded answers printed on the questionnaire. Structured, closed questions help reducing the length of the interview while still collecting as much information as possible. Pre-coded answers facilitate data entry. If the answers are not printed

on the questionnaire, it is possible that interviewers start avoiding the effort of always consulting the code book, but develop their individual set of commonly used replies, finally resulting in interviewer bias.

Additionally, we were concerned about a clear layout with unambiguous and precise interviewer instructions. This helps in filling out the questionnaire and consequently reduces interviewer errors, probable frustration of the interviewers and the length of the interview [Grosh and Munoz (1996)].

- *Sequence of questions*. The order of questions should be logical both to the interviewer and to the respondent to preserve their motivation and cooperation. Starting the interview with easy questions to develop a comfortable working atmosphere, the more difficult questions should possibly be asked early enough before the respondents get tired. Furthermore, punctuating the interview several times by a change of topic maintains the respondents' interest. The NHDHS therefore has four modules, the first one being a module that simply collects demographic characteristics, the second one contains the more delicate questions on income and agricultural production and the third and forth module are highly structured ones that are designed to quickly assess epidemiological data and data on the demand for health care.

- *Wording of the questions*. One of the fundamental principles of questionnaire design is simplicity of language. The questions should be unambiguous and clear. Two possibilities of how the questions are asked can be distinguished, both carrying their own potential for bias:

To avoid *interviewer bias*, the questions can be asked in a standardized form that leaves no scope for changes on the part of the interviewers. This standardization can reduce the variability created through the random variation of wording each interviewer might introduce. It can be used if the questions are simple enough and it is likely that all respondents will understand them. If this is not the case, *respondent bias* is likely to occur. Since the respondents might misunderstand the questions or interpret the question in their own way, even more "noise" can be introduced [Bradburn and Sudman (1991)].
In the setting of the NHDHS, where most respondents did not receive much formal education, we directed the interviewers to explain the questions to the respondents just as the respective situation required. They were instructed to take care that the respondents fully understood what they were asked. We wanted to ensure that the concept behind the question was uniformly understood rather than asking a uniform question that might be understood in many different ways.

- *Language of the questionnaire.* To ensure that all ethnic groups encounter the same interview situation, ideally, the questions should be translated in every language spoken in the field [Ainsworth and van der Gaag (1988)]. For logistic reasons we couldn't translate the questionnaire in all the local languages but had to resort to on-the-spot translation by the interviewer. There is a *lingua franca* that most respondent households understand (Dioulla), nevertheless we tried to always select interviewers that were capable of the respective local language. Additionally, a few parts of the questionnaire, for example the list of diseases, are available in Dioulla.

- *Design of responses and response alternatives.* A general rule is that pre-coded answers should be comprehensive and mutually exclusive. Moreover, "Don't know" and "Other" categories are usually recommended [Schwarz and Hippler (1991)] to avoid item non-response. We trained interviewers to use these categories only when really necessary and not

as an easy exit to avoid taking the pains of finding the category that fits best. Another problem one should be aware of, is that the order of response alternatives can influence the respondent's answer [Schwarz and Hippler (1991)]. Finally, whenever recall periods were used (for example "assessment of money income of the last month"), they were designed to be as short as possible and as long as necessary [Deaton (1997)].

- *Respondent rules.* During the data collection in the field, it is tempting for the interviewers to let somebody else give the answers for a household member who is currently not at home. To avoid this, respondent rules were set out. Each adult had to respond to questions concerning himself. The best-informed parent or care-taker (usually the mother) was asked to respond for children and the best-informed adult(s) (usually the woman or women responsible for cooking) was inquired on questions related to food consumption and nutrition.

- *Recall periods.* A difficult trade-off has to be solved here. On the one hand, it is tempting to measure the whole period under investigation to get all the analytically relevant information. On the other hand, extended recall periods potentially introduce bias, since the respondents only remember salient and recent events. Therefore, two recall periods are used in the NHDHS: the last month and the five months preceding the last month. Like this, the whole six months between two survey waves are covered. Nevertheless, the responses to the last month are most probably more accurate. The quality of the information on the longer recall period still has to be verified.

4.2 The Main Questionnaire

The main questionnaire of the NHDHS serves as the starting point of the interview. It identifies the respondent's household and contains the household roster. This questionnaire comprises the following four sections:

I. Identification of the household

The first page of the NHDHS questionnaire serves the identification of the household. The DSS data base already contains information on every household of the NHDHS. The fields *Community/Village*, *Sector/Quarter*, *HH ID* (household identification number), *Household Head*, and *ID HH Head* (identification number of household head) are already filled out when the questionnaire is printed. The other fields mainly serve control purposes.

The field *Sample* indicates if a household is part of the ordinary sample of the household panel that was selected at the beginning of the survey or if it might belong to an extra survey for other purposes. One example is a planned project where parts of the NHDHS questionnaire shall be administered to households where a death occurred to be able to analyze both the potential determinants of mortality and the short and long term consequences of mortality.

II. Household roster

The household roster contains a complete list of all household members as recorded during the last *Vital Events Registration*. The information on rank, name, individual identification number, kinship, sex, date of birth, ethnic group, religion, education level, marital status, and occupation is printed out with the questionnaire. The rank is a serial number that each

recorded household member got during his first interview to facilitate - together with his name - his identification across the different pages of the questionnaire.

For kinship, two columns are reserved, in order to try to represent the whole kinship pattern. The first column records the parental relationship, and the second column displays to whom this relationship exists, e.g. brother of individual possessing rank 1 (usually the household head) or son of individual with rank 3 (for example the second wife of the household head). In the first place, kinship is recorded in relation to the household head (mother, brother, or wife of the household head). But children are related to their mother, which for example allows to keep track of the education of the mother, a variable that is often used in the analysis of specific research questions (e.g. estimation of a health production function).

Extra lines are added to write down the respective information for new household members who eventually entered the household since the last VER. During data entry, this information will be updated in the data base of the DSS. Furthermore, also to update the DSS data base, the household member's *State of residence* is recorded, and if the household member died since the last VER. As state of residence, two alternatives are possible: a household member can be either *resident* or *absent*. An individual is absent if he is a household member by definition (see paragraph 3.1 *Definition of some fundamental concepts*), but was absent the night before the survey interview. Otherwise, he is resident.
Additionally to the information concerning the DSS, the household roster collects all information that can easily be recorded within such a framework: information on formal education, tobacco consumption, appreciation of one's own health state in general and three filter questions that are asked to select those individuals eligible for the morbidity module.

III. Housing

The objective of this section is to provide information on the household's housing. To some extent this reflects the well-being of the household. Moreover, it can serve as an indicator (or part of an indicator) for the household's hygienic situation and the density of the household's living arrangements. These factors can be possible risk factors for the health status of the household members, and should be assessed as such. See the corresponding module of the questionnaire for details on how the information on housing is assessed.

IV. Water and sanitation

The questions of this section represent (together with the section on housing) the hygienic situation of the household. Since hygiene cannot be measured on a cardinal, continuous scale, measurement alternatives have to be developed: One measure could be an indicator comprising different aspects of hygiene, e.g. food, housing, water and sanitation. Another alternative could be an expert rating (preferably one and the same expert rates the hygienic situation of all households on a scale). See the corresponding module of the questionnaire for details on how the information on water and sanitation is assessed.

The NHDHS offers the opportunity to employ both measures and to evaluate them against each other. Since for logistic and cost reasons it was not possible to have a totally consistent expert rating, we resorted to interviewer judgements on a five-point Likert scale. To ascertain a certain level of consistency, rating criteria were discussed and example households were evaluated as part of the training of the interviewers.

4.3 The Socio-Economic Module

The relationship between health and wealth plays a prominent role in the health economics literature [see for example Smith (1999), or Duncan and Strauss (1997)]. The same holds for the relationship between nutritional status and health [see for example Lee et al. (1997), or Alderman and Garcia (1993)]. The socio-economic module gathers data on assets, income, expenditures and the nutritional situation of the household. It comprises the following four sections:

I. Assets of the household

Section I tries to measure the wealth of the households of the study population. As opposed to the household's revenue, which refers to a recurring stream of income, wealth in this narrower sense reflects the asset situation, originating from past savings, inheritance or gifts. In the Nouna area, firstly, people are very poor and there are not many assets to consider, and secondly, since there is not much to store, not many alternatives were developed how to store wealth. There is practically no banking system. Land doesn't belong to individuals but to the traditional clan and can't be sold nor rented.

In the rural area, buildings can neither be sold nor rented. In Nouna itself, houses can be rented or sold but there is no well-functioning market for realty. It would have been very difficult to place a money value on buildings. Consequently, we decided to not collect data on real estate as part of the household's asset situation.

The most common store of purchasing power in the study area of the NHDHS is livestock. Domestic animals represent accumulated savings. And with regard to livestock, property rights are well-defined. Every household member can own animals and the best way to assess a household's livestock is to ask every household member separately what she or he possesses.

In addition to the information on livestock we collected information on durable goods (agricultural tools, transportation vehicles, etc.), since these are also likely to represent the economic well-being of a household. The information on goods and animals can serve as components of a wealth indicator, supplemented by adequate information on the respective prices. Yet, we didn't ask the respondents to give a money value for their goods and livestock, since we, firstly, expected that the respondents might not be able to give reliable answers, and secondly, we believe that pricing each good and livestock would increase the respondent's burden excessively. Hence, when analyzing the data we will have to assign market prices that were collected outside the NHDHS.

II. Household revenue

Approximately 80% of the study population lives from subsistence farming. Agricultural production is the most important source of revenue. Since there is only one annual harvest, the subsection on the *agricultural production* is administered only in the December/January wave (apart from the initial wave in July 2000 which collected data on the harvest of 1999). In the study area, it is common that different household members cultivate their own piece of land and thereby gain their own income. Thus, every household member above ten years of age was asked to specify what he cultivated and in what quantity.

Typically, a big part of the agricultural production is directly consumed by the household itself. But some is also used to generate cash income. Section 2.2 of the questionnaire assesses *money income through the sale of agricultural products.* Two recall periods are used: the last month and the five months preceding the last month. The responses to the last month are most probably more accurate, but nevertheless the whole year is covered. The same principle for recall periods is used to collect data on *transfers and pensions* and on *other money income* (especially salaries and trade).

III. Household expenditures

Household expenditures are surveyed simply by asking every economically active household member, i.e. every household member above ten years of age, if he spent money on any item of a list that is read to the respondents. Again, two recall periods are used (see above). In the rural area, money expenditures are so sporadic that it should be possible to remember them for a longer time. Besides, a longer recall period will also balance out big fluctuations in the expenditure pattern, which are quite common in the area, e.g. because of religious expenditures, expenditures for ceremonies (gifts for funerals, marriages, and baptisms) or the purchase of fertilizer or seeds.

IV. Food and nutrition

When assessing nutritional status one preliminary remark is important. There is a logical distinction between the assessment of the nutrient or dietary *intake* and the assessment of the *outcome* [Gibson (1990)]. Nutritional input concerns itself with the amount and quality of food eaten by the individual in question. The crucial variable is the energy or calorie intake. By contrast, output variables are different anthropometric measures such as body weight, height, body fat and muscle mass. In terms of output measures, a further distinction is made between measures of past, chronic malnutrition, such as stunting, and measures for current, acute malnutrition, such as wasting [Waterlow (1992)].

In general, outcome variables measure nutritional status with respect to the subject's well-being. For instance, if the respondent displays a better *Body Mass Index* (BMI), this usually indicates that the individual is well-nourished [Shetty and James (1994)]. This need not necessarily be the case, though. A poor health can also lead to a low BMI even if the dietary intake is high [Martorell (1982)]. Diarrhea, for example, is a prominent case in point. There is a vast literature on the interdependent relationship of health and nutrition [see for example Tomkins and Watson (1989) or Behrman and Deolalikar (1988)]. To be able to isolate which variable influences which, it is necessary to assess both input and outcome at the same time. As outcome measure we are planning to record the height and weight of all household members in a separate anthropometric survey (see paragraph 7.2.5 *The anthropometric module*) that will be launched during the third wave of the NHDHS.

As far as the measurement of the dietary intake is concerned, two different dimensions of unsatisfactory food consumption have to be considered, namely malnutrition (not the right food) and undernutrition (simply not enough food), each having slightly different implications for health policy. Assessment methods include the clinical examination of food composition. Unfortunately, these methods are not feasible in our context, mainly for logistic reasons. An alternative method is a food consumption survey. There is an extensive literature on how to conduct such surveys [see for example Cameron and van Staveren (1988), FAO (1990), or Thompson and Byers (1994)]. One of the major implications of this literature is that measuring dietary intake is a demanding and complex task. Common techniques are food

recalls or food frequency tables. Usually these surveys are implemented as single-topic surveys done by nutritionalists interested solely in the nutritional situation of a population or specific high-risk subgroups of a population.

The NHDHS tried to find an easy way to measure dietary intake without increasing the respondent's burden in a way that endangers the quality of the resulting data set as a whole. In discussions with members of the CRSN we believe that we found a way to build at least

categories of nutritional status. We decided on a food frequency table. The data thus collected represents the nutritional situation of the household as a whole, the intra-household allocation of food is not assessed. Though this information would undoubtedly be very valuable, the extra effort that it would demand appears to be prohibitive.

4.4 The Morbidity Module

To obtain a comprehensive overview of the burden of disease (BOD), the morbidity module collects data on handicaps, and on chronic and acute diseases. Additionally, the cause of the disease or handicap, and its duration and severity are recorded. This information can be used as input in summary measures of the BOD by cause, for example the YLD (Years Lived with a Disability) [for the technical basis of the measurement of health outcomes in general see Dolan (2000), and for the YLD in particular see Murray (1996)].

A question in the main questionnaire serves as a filter to identify the household members stating to have a health problem. Each health problem is recorded separately in one line of the questionnaire and gets an identification number that helps to identify the health problem or illness episode later on in the questionnaire. Since it is possible that one or more household members have more than one health problem, several lines can be used for one and the same individual.

An *Inventory of Handicaps* lists all household members who have one (or more) of the handicaps given by a pre-coded list of handicaps. They are asked what caused the handicap, how they got to know the cause of the handicap, and the date, when the handicap started. Furthermore they have to give a judgement about the limitations the handicap imposes on them on a pre-defined scale:

6 = needs assistance for eating and personal hygiene
5 = limitations in daily activities like preparing meals, house-keeping or looking after live-stock
4 = can't work in the fields or do handicraft
3 = limitations in several domains like recreational activities, sports, education, and reproduction
2 = limitations in ONE of the domains given above
1 = no limitations at all.

This rating of functional impairment was inspired by the work on disability weights as proposed by Murray [1994], as one possibility to reflect the severity of a handicap. The question on the cause of the handicap is meant to allow to calculate the BOD by cause, which permits to use the data for health policy purposes. A paralysis, for example, can be caused by poliomyelitis or by a traffic accident and has to be classified accordingly. The information on how the respondent got to know the cause of the handicap serves as an indication on the precision of the diagnosis. If it's obvious, as for example in the case of an accident, the

handicap can be classified without any doubt, but if the respondent only presumes that for example his blindness was caused by onchocerciasis some caution might be indicated or extra information has to be collected.

A similar procedure is pursued while compiling the *Inventory of Chronic Diseases* and the *Inventory of Acute Diseases*. For each disease episode, information on the cause is collected and the duration and the severity of the health problem is assessed. As a first approach to classify the severity of the disease – which can serve as a possible basis for the calculation of disability weights – the respondent is asked to offer his or her personal assessment (ranked from "very bad" to "not bad at all"). Individual judgements on such a 5-point Likert scale have been commonly used for the evaluation of different health states [McDowell and Newell (1987)]. The reliability and usefulness of this method has still to be verified for our study. Another potential building block of the assessment of the preferences over health states, which shall be reflected by disability weights, is the rating of the functional impairment the disease has brought about. For reasons of comparability, the same codes as for the inventory of handicaps are used here.

Instead of simply asking the respondent how long he has been ill, the commencing date and the date when the disease episode stopped are written down, together with a control question if the disease was over at the time of the interview or not. This procedure seems advisable in order to increase the precision of our measurements.

The *diagnostic methodology* used in the morbidity module requires special attention. On the one hand, it is crucial for the presentation of the burden of disease by cause which in turn has strong health policy implications, for example for priority setting [see Würthwein et al. (2001)]. On the other hand, it is very difficult to get a reliable diagnosis solely with the instrument of a questionnaire. Nevertheless, in developing countries, where resources in the health sector are low and at the same time not much epidemiological information is available, questionnaires are a common diagnostic instrument, since they are both cheap and feasible [Barreto (1998)]. Validation studies of questionnaire screening methods draw an ambiguous picture of their reliability and validity, though [Kalter (1992)].

The diagnostic methodology of the NHDHS permits the diagnosis of the cause of the health problem in three possible ways. First of all, the respondent is asked to report by himself what disease he's suffering from. In the literature, this method is called *reported illness* and has been used previously to measure morbidity in the absence of further information [see for example Curtis and Lawson (2000), or The Iowa Persian Gulf Study Group (1997)]. To improve upon this approach, the respondent is also asked how he came to know the cause of his health problem. The answers to this question allow us to deduce the level of precision of the reported illness. If, for example, he says, that he got a diagnosis from a health personnel, we might accept it as a clinical diagnosis, since it represents the clinical standard of the area.

As a second diagnostic instrument, the respondent can report up to six of the most striking symptoms that accompany his illness out of a pre-compiled list of signs and symptoms. Diagnostic algorithms can then be used to detect the disease with a certain level of reliability and validity, e.g. if somebody has headache and fever and a stiff neck, then meningitis might be recorded as the diagnosis. A third approach, which can't be used on the individual level, though, is the redistribution of specific signs and symptoms using a priori information. For example, from all the fever cases in our study region, epidemiological studies would hypothetically estimate that in comparable sub-Saharan regions approximately 60% are

malaria, 20% meningitis, 10% influenza, etc. Such a-priori information still has to be collected, though.

The shortcomings of this diagnostic methodology are obvious, albeit in the context of the described situation in SSA with low health care resources and limited epidemiological information, the proposed methodology seems to be a feasible approach. In any case, the methodology is competitive to other approaches that have been used or described in the literature. Nevertheless, a validation study is in preparation and will be carried out in the course of the NHDHS project.

As a further building block of the calculation of disability weights, in section 4 *(Severity of Health Problem And How The Household Managed The Occurring Difficulties)* of the questionnaire some more questions on the severity of the health problem are asked. On the one hand, they can be used to check and balance the individual severity judgements. For example, if a respondent had judged the disease to be not very bad, but later he would have stated that it had threatened his life, some caution is warranted. On the other hand, the NHDHS allows to calculate disability weights on the basis of different aspects: personal severity judgements, functional impairment, interference on occupation and work, obstacle for social interaction, and threat of life.

Furthermore, section 4 collects information on the household costs of illness. To be able to understand to what extent illness is not only a burden to the individual but also to the household, information is collected on the reduction of household productivity because the sick person and other household members who had to take care of him couldn't work or go to school. In this manner, the disease led to an impairment of the household's investment in human capital formation [see Schultz (1999) on the relevance of health and education as investments in human capital and the lack of these factors as a major cause for the slow growth in Africa]. Moreover, coping strategies of the household are examined: on the one hand, how the household coped with the transitory reduction of the household's labor force and on the other hand, how induced expenditures were dealt with [Sauerborn et al. (1996b)]. Since time loss is an important component of the household's costs of illness [Sauerborn et al. (1995)], the section *Helpers of the Sick Person* collects more detailed information on this issue.

In view of the fact that the *Demand for Health Care* plays a central role in health economics as well as in health policy, the morbidity module contains an elaborate section on this issue. For each health problem, information on three treatment episodes can be recorded per line. If the respondent reports more than three treatment episodes per illness episode, naturally, the interviewer can use further lines. With this simple structure, it is possible to keep track of the possibility that one household member has several health problems which themselves have several treatment episodes without using too many different questionnaire sheets.

Furthermore, the possibility to link the specific disease, and the treatment and the demand thereby initiated allows to analyze disease-specific demand and treatment patterns. With the information thus collected, a variety of health-policy relevant questions can be answered. For example, the propensity to visit a traditional healer instead of a modern health care facility might vary across diseases. Last but not least, the expenditures and costs per treatment and per illness episode are recorded. This includes not only the costs of the treatment itself, but also transportation costs, time loss of the sick person and the caretaker, and the costs of the daily living at the place of treatment if applicable. Different treatment costs can thus be compared, and costs per specific disease can be calculated.

4.5 The Module on Preventive Health Care and General Health

In developing countries, often the demand for health care mainly comprises acute, catastrophic care. In spite of this or one could also say particularly for this reason, a separate module collects information on preventive health care, such as vaccination, antenatal care and mother and child care. This module is analogous to the section on demand for health care of the morbidity module. It's aim is to get to know why individuals used preventive care, what kind of preventive care they were using, and what costs were invoked. This information can be very useful for health planning and health policy both at the level of the Nouna health district and at a higher level in the ministry of health. Additionally, data on family planning are collected.

4.6 The Anthropometric Module

As anthropometric measures weight and height are measured for each household member of the sample. For adults and children of two years or older the stature is measured: the subject is standing on a platform and its height is measured using a stadiometer. For children below two years of age the recumbent length is measured: the child is lying on its back and while applying gentle traction, the body length is measured using a wooden measuring board. The weight is taken with appropriate scales, one for adults and children 5 years and older and a more sensitive one for children below 5 years of age [Gibson (1990)]. The anthropometrists get a special training stressing the need for reliable and valid measurements, which shall be obtained through the use of high-quality equipment, the perpetual readjustment of the scales and the accurate work of the anthropometrists.

In order not to overburden households during the survey rounds, the anthropometric module is carried out separately from the other modules. An anthropometric team visits the villages included in the sample and measures all household members of the household sample, using a list generated from the data base of the DSS/NHDHS. The equipment can be carried to a central place. The persons in question are asked to meet the anthropometrist there. This procedure is much faster and more efficient than conducting the anthropometric measurements during the household interviews. This would imply to carry the equipment from household to household while increasing the length of the interview and thus the respondents burden.

4.7 Additional Questions and Modules

The questionnaire described above will be the standard questionnaire of the NHDHS and is suggested as a frame of reference for surveys pursuing similar analytical objectives. It will not undergo major changes to guarantee comparability over time - a necessary prerequisite for the implementation of longitudinal studies. But apart from that, it is principally possible to include a few additional questions in one or more consecutive waves if a special topic is to be studied either for academic or health policy reasons. In the case of the NHDHS, for example, the wave in January 2001 will include a module on the Willingness-to-Pay for a benefit package of a community-based health insurance scheme.

5. Conclusion and outlook for further research

The Nouna Health District Household Survey is a major combined effort to gather a rich and complex data set. This data set is a valuable source of information for both the purely scientifically interested researcher and the decision maker in the field of health policy and planning. Firstly, it helps the researcher to better understand the theoretical issues that are still not well understood and empirically investigated in the context of developing countries, e.g. such questions as health inequality, the causal relationship between health and wealth, or the measurement of the economic burden of disease. Secondly, it enables the health politician to ground health political decisions on a sound information base, such as for example priority-setting on the basis of locally measured epidemiological data, or the planning of the supply of medical care with a better understanding of the demand side.

There exist a variety of data sets covering socio-economic data [Grosh and Glewwe (1998)], and an increasing number of epidemiological studies are implemented in sub-Saharan Africa [INDEPTH (2001)]. But to our knowledge, the combination of detailed epidemiological data (mortality and morbidity by cause), and a comprehensive collection of information on demographics, socio-economic status, nutrition, hygiene, and the demand for health care is a rather innovative undertaking. It not only allows the study of important topics in health economics, but also offers the opportunity to associate the burden of disease by cause with possible predictors, which opens an interesting perspective with respect to the need for reliable epidemiological data for SSA, as it permits conditional projections that probably possess a strong potential to be more specific and reliable than pure extrapolations on the basis of demographic data alone.

Apart from extraordinarily high response rates and the fact that the interviewers are known in the field which potentially reduces dishonesty of the respondents, further advantages of the NHDHS are its longitudinal design which potentially allows the identification of causal effects in cases where this is hardly possible in a cross-section setting. Moreover, seasonal variation is captured, firstly, with respect to the economic situation, since the survey takes place once in the planting season and once in the harvest season, and secondly with respect to the epidemiological situation, since information on morbidity is collected four times a year [Sauerborn et al. (1996a)]. Previous experience of the health personnel of the study region shows that due to the climatic variation, a strong variation of diseases can be observed. In February, the dry weather and the *hamattan*, a hot and dusty wind blowing from the Sahara, favors the prevalence of respiratory infections, whereas the rainy season witnesses a high prevalence of malaria.

In spite of the novelties and the advantages of the NHDHS vis-à-vis other surveys, it is well-understood that the NHDHS also faces a series of problems, that have to be taken charge of. Apart from the usual pitfalls of surveys such as measurement error, respondent's bias, recall error, interviewer bias, missing values, etc. [Biemer et al. (1991)], the NHDHS has to tackle a special difficulty concerning the measurement of the burden of disease by cause. Even diagnoses from trained medical personnel are not immune against errors. The diagnostic methodology implemented in the morbidity module sets a certain standard, but quite naturally will not be perfect. To be able to quantify the error that the morbidity measurement undergoes, a validity study at least for malaria, most probably the most frequent disease in the study area [Würthwein et al. (2001)], is in preparation and is expected to provide the appropriate figures for reliability and validity of the diagnostic instrument used.

Further research in the direction of the survey methodology employed, comprehends the ordering of questions. In a future wave, for instance, it is planned to move the question on the valuation of the respondents own health status from the main questionnaire to the module on preventive care and general health, to see if the respondent rates his own health lower after having talked about health questions. Intuitively this is to be expected, which raises doubt on the usage of this question as a proxy for the actual health state of respondents in several health surveys that don't take the pains to collect epidemiological data. Another interesting question will be to investigate in as much the interviewer judgements, e.g. on the cleanliness of the household's dwelling, are reliable and valid. It would be possible, for example, to validate the interviewer judgements vis-à-vis a cleanliness indicator constructed from clear-cut questions about hygiene, housing, and water supply (see section III and IV of the main questionnaire). Moreover, one could examine whether there are strong differences between the mean judgements of each interviewer. Under the assumption that there is no systematic bias with respect to the cleanliness of the households interviewed by each interviewer - which would hold if a random assignment of interviewers and households was achieved - differences between the mean ratings would reveal a respondent's bias at this point.

Acknowledgements:
This research was supported by the *Deutsche Forschungsgemeinschaft* under the research grant *Sonderforschungsbereich 544, Control of Tropical Infectious Diseases.* We thank all the staff of the CRSN, the Ministry of Health of Burkina Faso, and the households surveyed for their valuable help and cooperation.

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Appendix

On the following pages, the full questionnaire of the Nouna Health District Household Survey is given as it was used in the first wave of the survey in July 2000. The original language of the questionnaire is French, apart from some codes that are available in Dioulla also. Translation of the questionnaire was provided by Ralph Würthwein and Osman A. Sankoh.

MINISTRY OF HEALTH

GENERAL SECRETARIAT

NOUNA HEALTH
RESEARCH CENTER

BURKINA FASO

Unité – Progrès - Justice

QUESTIONNAIRE OF THE

NOUNA HEALTH DISTRICT HOUSEHOLD SURVEY

I. Identification of Household

Date of Visit |_|_| |_|_| |_|_| **Sheet Nr.** |_|

Community/ Village _____ **Code:** |_|_| **Total Nr. of Sheets** |_|

Sector/Quarter _____ **Code:** |_| **Sample** |_|

HH ID |_|_| |_|_|_| |_|

Household Head _____ **ID HH Head** |_|_|_| |_|_|_| |_|_|_|

Principle Respondent _____ **ID Princ. Resp.** |_|_|_| |_|_|_| |_|_|_|

Interviewer	**Field Supervisor**	**Data Entry Clerk**	**Supervisor of Data Entry**
Code |_|_|_|	**Code** |_|_|_|	**Code** |_|_|_|	**Code** |_|_|_|
Date |_|_| |_|_| |_|_|	**Date** |_|_| |_|_| |_|_|	**Date** |_|_| |_|_| |_|_|	**Date** |_|_| |_|_| |_|_|
Signature	**Signature**	**Signature**	**Signature**

II. Information on Household Members

HH ID |_|_| |_|_|_| |_|

<table>
<tr><th colspan="11">Every HH member</th><th colspan="2">Members aged 6+</th><th></th></tr>
<tr><th>Nr.</th><th>Rank</th><th>Name and Individual ID</th><th>Parental relation-ship</th><th>To whom</th><th>Sex</th><th>Date of birth</th><th>Deceased (Yes / No)</th><th>State of residence</th><th>Ethnic group</th><th>Religion</th><th>Knows to read and write? If yes, in what language?</th><th>Instruction level</th><th>Marital status</th></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr>
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New Household Members

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<table>
<tr><th colspan="9">Members aged 10+</th><th colspan="4">Every HH member</th></tr>
<tr><th>Occu-pational status</th><th>Princi-pal occu-pation</th><th>Situation in princi-pal occu-pation</th><th>Secondary occupation</th><th>Situation in secon-dary occu-pation</th><th>Smoker? Yes / No</th><th>How many cigarettes per day?</th><th>How many pipes per day?</th><th>Since how many years?</th><th>What do you think of your health state in general?</th><th>Do you have an acute illness (now or in past month)?</th><th>Do you have a chronic illness?</th><th>Do you have a handicap?</th></tr>
<tr><th>15</th><th>16</th><th>17</th><th>18</th><th>19</th><th>20</th><th>21</th><th>22</th><th>23</th><th>24</th><th>25</th><th>26</th><th>27</th></tr>
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New Household Members

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III. Housing (Note: Only one single cross for each question)

Type of dwelling	Nature of walls	Nature of roof	Nature of floor	Total No. of rooms occupied	Toilet
H1	H2	H3	H4	H5	H6
Building |_|	Hard |_|	Concrete |_|	Tiles |_|	Count the rooms the HH occupies, incl. bedrooms and living rooms.	WC w. running water |_|
Villa |_|	Semi-Hard |_|	Sheet |_|	Cement |_|		Latrines w. ven-ilated pit |_|
Single-family home |_|	Banco,impr. |_|	Tiles |_|	Beaten ground |_|		Ordinary latrines |_|
Several huts and houses |_|	Banco |_|	Beaten ground |_|	Sand |_|		In nature |_|
Round huts |_|	Straw |_|	Straw |_|	Other |_|	|__|__|	Other |_|
Other |_|	Other |_|	Other |_|			

The following question has to be answered by the interviewer.

H7 Judge on the general state of the dwelling: Has it been

Very clean	|__|	Dirty	|__|
Clean	|__|	Very Dirty	|__|
Clean enough	|__|		

IV. Water and Sanitation

Water source			Water disposal	Trash disposal	Water conservation
E1			E2	E3	E4
	Rainy season	Dry season	Courtyard |_|	Dustbin, inside |_|	*Pots or earthenware jars*
Running water				Dustbin, outside |_|	Always covered |_|
At home	|__|	|__|	Outside courtyard |_|	Heap of rubbish, inside |_|	Sometimes covered |_|
Outside home	|__|	|__|		Heap of rubbish, outside |_|	
Public fountain	|__|	|__|	Absorbing well |_|	Ditches |_|	*Seals*
Drilling (pump)	|__|	|__|		Vat |_|	Always covered |_|
Mechanic well			Gutters |_|	Street |_|	Sometimes covered |_|
At home	|__|	|__|		Other |_|	
Outside home	|__|	|__|	Septic tank |_|	**After how many days do you normally change your water ?**	*Water-bottle*
Ordinary well				**E5**	Always coverd |_|
At home	|__|	|__|	Other |_|	(in days) |__|	Sometimes covered |_|
Outside home	|__|	|__|			
Rivers and backwaters	|__|	|__|			
Other	|__|	|__|			

E5 If the HH fetches water outside the house, how does he transport the water? In barrels |_| In 'canaris' |_| In seals |_| In cans |_| In basins |_|	**E6**	The following questions have to be answered by the interviewer himself: Are there heaps of rubbish in the courtyard ? A lot |_| Quite a bit |_| Some |_| Little |_| None |_|
	E7	Are there animals living in the courtyard (except chicken)? Yes |_| No |_|
	E8	The kitchen / the place where one prepares the meals is Very clean |_| Clean |_| Clean enough |_| Dirty |_| Very dirty |_|

MODULE 1: SOCIO-ECONOMIC INFORMATION

Village |__|__| **Name of household head** ____ **HH ID** |__|__| |__|__|__| |__|

Date of visit |__|__| |__|__| |__|__|__|__| **Name of Interviewer** _____________________________________ **Code** |__|__|__|

Section 1 : Animals and goods of household

1.1) Animals

How many animals does every HH member own at the moment

Rank	Name of HH member	Member owns animals ? YES/NO	Poultry	Sheep	Goats	Cattle	Donkeys	Pigs	Horses
1	2	3	4	5	6	7	8	9	10
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|
|__|__|		|__|__||__|	|__|__|	|__|__|	|__|__|	|__|__|	|___|	|__|__|	|___|

1.2) Durable goods

Ask **every** HH member if he owns any of the goods given below !

Rank	Name of HH member	Member owns something Yes / No	Ploughs	Carts	Bicycles	Mopeds	Motor-bikes	Cars	Radios	TV sets	Telephone	Fridge	Modern kitchen	Other
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

<u>Section 2</u>: Household revenue

2.1) Agricultural production during last season *(1999/2000).*

Ask the following question to every HH member aged 10+:

In the last season did you cultivate any of the products I'm reading to you now ? (As given in the code list.)

Rank	**Name of HH member**	**Cultivated anything ?** Yes / No	**Agricultural Product**	**Quantity**	**Unit of measurement**
1	2	3	4	5	6
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|

Codes for agricultural products

MIL = Millet
SOR = Sorgho
MAI = Maize
RIZ = Rice
FON = Fonio
ARA = Peanuts
SES = Sesame
HAR = Beans
PEP = Peas
CAL = Melons
TAB = Tobacco
COT = Cotton
AUT = Other (specify)

Codes for units of measurement

BOI = Box
TIN = Jar
SAC = Sac
CHA = Cart
KIL = Kilogram
NOM = Number
TON = Ton

2.2) Money income through the selling of agricultural products

Attention interviewers:: Column 6 is not the product of column 5 times 5, but the actual amount of money each HH member received during the 5 months preceding the last month. Make sure you clarified this point for the respondent.

Rank	Name of HH member	Received any money income ? Yes / No	Agricul-tural products	Amount received last month	Amount received the 5 months preceding the last month
1	2	3	4	5	6
|__|__|		|__|__|__|	|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|
|__|__|		|__|__|__|	|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|
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Codes for income source

ARA = Peanuts and related products
MIL = Millet/ sorgho and related products
COT = Cotton and related products
MAI = Maize and related products
RIZ = Rice and related products
FON = Fonio
NIE = Niébé and related products
SES = Sesame
IGN = Yam, potato
AUC = Other crops
MAR = Gardening crops(tomatoes, onions, etc.)
FRU = Fruit
KAR = Karité (oil and butter)
NER = Néré (grains and soumbala)
AUP = Other wild-grown products (honey, tamarind) and hunting products
BIV = Sale of bivins
CAP = Sale of caprins
OVI = Sale of sheep products
POR = Sale of porcine
ASI = Sale of asins
VOL = Sale of poultry
AUA = Sale of other animals
PAN = Sale of animal products (eggs, milk, leather, etc.)
PEC = Sale of fish

2.3) Transfers and pensions

Ask **every** HH member: *Did you receive any money from the sources and for the destinations I am going to read to you now ?* (see code list!)
Attention interviewers:: Column 5 is not the product of column 4 times 5, but the actual amount of money each HH member received during the 5 months preceding the last month. Make sure you clarified this point for the respondent.

Rank	Name of HH member	Received any money ? Yes / No	Amount of last month	Amount received the 5 months preceding the last month	Source	Desti-nation
1	2	3	4	5	6	7
|__|__|		|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|	|__|__|__|	|__|__|__|
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Codes for source of money

PAR = relatives
EPA = emigrated relatives
AMI = friends
EAM = emigrated friends
CRE = Credit
AUT = other sources

Codes for destination of money

SOU = transfers without specific destination
FET = ceremonies like weddings, baptism, funerals etc.
SOI = medical care
SCO = school fees
AUT = other destinations

2.4) Money income

Ask **every** HH member: *Did you receive any money from any of the income sources I'm going to read to you now ?* (see code list!)
Attention interviewers:: Column 5 is not the product of column 4 times 5, but the actual amount of money each HH member received during the 5 months preceding the last month. Make sure you clarified this point for the respondent.

Rank	Name of HH member	Money income? Yes / No	Amount of last month	Amount received the 5 months preceding the last month	Source
1	2	3	4	5	6
|__|__|		|__|__|__|	|__||__|__|__||__|__|__|	|__||__|__|__||__|__|__|	|__|__|__|
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Codes

SAR = regular salary
SAO = occasional salary
SAJ = daily salary
VPN = selling of non-agricultural goods
COM = trade
PEN = Pension of any kind
AUT = other sources

Section 3: **Household expenditures**

Ask **every** HH member: *Did you spent money on any of the things I'm going to read to you now ?* (see code list!)

Rank	Name of HH member	Expenditures ? Yes / Non	Last month		5 months preceding last month	
			Expenditure on	Amount	Expenditure on	Amount
1	2	3	4	5	6	7

Codes for expenditures

LOY = rent
BOI = drinking
TRA = transport
EDU = education
REL = religious expenditures
VIV = daily living (food etc)
CER = ceremonies (funerals, weddings etc)
ENP = seeds/pesticide
ENV = money transfers
ANI = animals
SON = medical care
OUT = tools for agriculture etc.
MAT = construction materials (tiles, bricks, etc)
VET = clothing
AUT = other destinations
MOT = Means of transport
AQP =Other equivalent expenditures

Section 4 : Food and nutrition

Ask these questions to the woman that runs the household.
How many times do you eat the following food I'm going to read to you now ? (as given below in the 1st column of the table!) Indicate also the quantities and the units of measurement.

Food	Frequency	Number	Unit
Basic cereals (Millet, Sorgho, Maize, Rice, Fonio)	_____	____	_____
Beans	_____	____	_____
Peas	_____	____	_____
Yam, Potatoes, Manioc etc.	_____	____	_____
Sauce	_____	____	_____
Salad	_____	____	_____
Vegetables (like cabbages, tomatoes etc.)	_____	____	_____
Fruits (Bananas, Mangos, Oranges, other wild fruits)	_____	____	_____
Milk	_____	____	_____
Meat	_____	____	_____
Fish	_____	____	_____
Bread	_____	____	_____

Codes for frequencies

Per day:
2JR = more than 2 times a day
2PJ = 2 times a day
1PJ = once a day

Per week:
1PS = once per week
2PS = twice a week
34S = 3 or 4 times per week
56S = 5 or 6 times per week

Per month (rare food):
QFM = some times per month
13M = once all 3 months
16M = once in half a year
1AN = once in a year
JAM = Never

Codes for units of measurement

BOI = box (garibout gongho)
TAS = pile
BOL = cup
KIL = kilos
BOU = balls
NOM = numbers
LIT = liters

MODULE 2: MORBIDITY AND HEALTH CARE

Village |__|__| **Name of HH head** _____ **HH ID** |__|__| |__|__|__|__| |__| |__|

Date of visit |__|__| |__|__| |__|__|__|__| **Name of interviewer** _____ **Code** |__|__|__|

Section 1: Inventory of handicaps

Ask the HH members who said that they have a handicap (Col. 26 Mother questionnaire) what kind of handicap they're having if it's not visible.

Rank	Name of HH member	No. of health problem	What handicap do you have?	What caused the handicap?	How did you get to know the cause of the handicap?	Date when it started	Limi-tations
1	2	3	4	5	6	7	8
|__|__|		|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__| |__|__| |__|__|	|__|
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|__|__|		|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__| |__|__| |__|__|	|__|

Codes for limitations

6 = needs assistance for eating and personal hygiene
5 = limitations in daily activities like preparing meals, house-keeping or looking after live-stock
4 = can't work in the fields or do handicraft
3 = limitations in several domains like recreational activities, sports, education, and reproduction
2 = limitations in ONE of the domains given above
1 = no limitations at all

Codes for handicaps

PAI = paralyzed, legs
PAS = paralyzed, arms
AVE = blind
MAN = missing arm
HAM = mentally handicapped
STE = sterility
NSP = don't know
MUE = mute
SOU = deaf
UJA = missing leg

Codes for column 6

EVI = obvious (for example in the case of an accident)
NSP = don't know
MPD = mother or father told me
PDS = health personnel told me
AUP = others told me
MOM = by myself

Codes for 'Cause of handicap'
see manual for disease codes

<u>Section 2:</u> Inventory of chronic diseases (diseases somebody is having for more than 3 months).

Apart from the diseases we just talked about, did you have a disease in the last month that lasted already for more than 3 months ?

Rank	Name of HH member	No. of health problem	What chronic disease did you have ?	Code for chronic disease	How do you know ?	Symptoms	Date when it started	Date when it stopped	Disease over ? Yes / No	Severity of disease	Limitations
1	2	3	4	5	6	7	8	9	10	11	12
|__|__|		|__|	____________	|__|__|__|	|__|__|__|	|__|__| |__|__| |__|__| |__|__| |__|__| |__|__|	|__|__| |__|__| |__|__|	|__|__| |__|__| |__|__|	|__|__|__|	|__|	|__|
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Codes for chronic diseases

see code book

Codes for symptoms

see code book

Codes "How do you know ?"

EVI = obvious (for example in the case of an accident)
NSP = don't know
MPD = mother or father told me
PDS = health personnel told me
AUP = others told me
MOM = by myself

Codes for severity

5 = very bad
4 = bad
3 = bad enough
2 = not bad
1 = absolutely not bad

Codes for limitations

6 = needs assistance for eating and personal hygiene
5 = limitations in daily activities like preparing meals, house-keeping or looking after live-stock
4 = can't work in the fields or do handicraft
3 = limitations in several domains like recreational activities, sports, education, and reproduction
2 = limitations in ONE of the domains given above
1 = no limitations at all

Section 3: Inventory of acute diseases of last month

Apart from the diseases we were just talking about, did you, during the last month, have any diseases that didn't last very long ?

Rank	Name of HH member	No. of health problem	What acute disease did you have?	Code for acute disease	How did you know?	Symptoms	Date when it started	Date when it stopped	Disease over ? Yes / No	Severity of disease	Limitations
1	2	3	4	5	6	7	8	9	10	11	12
|__|__|		|__|	______________________________	|__|__|__|	|__|__|__|	|__|__| |__|__| |__|__| |__|__| |__|__| |__|__|	|__|__| |__|__| |__|__|	|__|__| |__|__| |__|__|	|__|__|__|	|__|	|__|
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Codes for acute diseases	Codes for symptoms
see code book	see code book

<u>Section 4:</u> Severity of health problem and how they coped with it

Rank	Name of HH member	No. of health problem	Did the health problem threaten your life ? Yes / No	Was it a social proble m for you? Yes / No	Did it hinder you from working? If yes For how long ? (D,W,M,Y) If no Col 7	During your illness, did other HH members care for you? If yes Col 08 If no Col 10	Did it prevent them from working If yes Col 09 If no Col 10	How to cope with the work	If you had any expenditures (medicament s, consultation, etc.) how did you cope with that ?	Could somebody of your HH not go to school because of your illness ?		
										He/she didn't go to school at all Yes Col.12 No Col. 13	How long did he/she not go to school? (H,D)	Why did he/she not go to school at all ?
1	2	3	4	5	6	7	8	9	10	11	12	13
								1 2 3	1 2 3			
								1 2 3	1 2 3			
								1 2 3	1 2 3			
								1 2 3	1 2 3			
								1 2 3	1 2 3			
								1 2 3	1 2 3			
								1 2 3	1 2 3			
								1 2 3	1 2 3			

Codes for working arrangements (question 9)

1 = we had help from people outside the HH without paying them
2 = other HH members did the work
3 = we employed persons from outside of our HH
4 = we did nothing
5 = other (specify)

Codes money arrangements (question 10)

1 = we sold goods / animals
2 = we got free medical care
3 = we got money as a gift
4 = we borrowed money
5 = we used cash / savings
6 = extra work against payment
7 = other (specify)

Code 'Why not going to school' (question 13)

1 = we needed the money dedicated for school purposes to pay the expenditures related to the disease
2 = we didn't earn the money we needed for school purposes because we couldn't work because of the disease
3 = he/she had to help at home
4 = he/she had to take care of the sick person
5 = other (specify)

Section 5: Demand for health care

Rank	Name of HH member	Disease code (refer to section 2 and 3)	No. of health problem	Did you treat the disease ? Yes / No If yes Col 6 If no Col 12	Who treated the disease?			Where did the treatment take place ?			Why did you choose this kind of treatment ?		
					1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
1	2	3	4	5	6	7	8	9	10	11	12	13	14
|__|__|		|__|__|__|	|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
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Code 'Who treated the disease ? (Question 6-8)

MOM = self-treatment
FAM = family member
AMI = friend, neighbor
INF = nurse
MAT = matron
PHA = pharmacist
SAG = midwife
ASV = village health worker
MED = medical doctor
GUE = traditional healer
AUP = other persons

Codes Place of treatment (question 7)

MAI = at home
VIL = this village
AVI = other village
CHD = Dédougou hospital
CMD = Dédougou central hospital
NCO = Nouna hospital
NNE = external consultation at Nouna hospital
AUT = Other
CKO = CSPS of Koro
CBO = CSPS of Bourasso
CDA = CSPS of Dara
CTO = CSPS of Toni

Code Why this choice ? (question 12-14)

ARG = not enough money for something else
CON = trust in his/her competence
PRO = nearest health service
AUT = other reason (specify)
PAI = 1st/2nd treatment didn't help
GRA = disease was very severe

<u>Section 5</u> : Demand for health care (continued)

<table>
<tr><th rowspan="2">Rank</th><th rowspan="2">Initials of name of HH member</th><th rowspan="2">No. of health problem</th><th colspan="3">What was the quality of the treatment ?</th><th colspan="3">Expenditures for transportation ?</th><th colspan="3">Duration of travel/transport (in hours)?</th></tr>
<tr><th>1st</th><th>2nd</th><th>3rd</th><th>1st</th><th>2nd</th><th>3rd</th><th>1st</th><th>2nd</th><th>3rd</th></tr>
<tr><td>1</td><td>2</td><td>3</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|.|__|__|</td><td>|__|.|__|__|</td><td>|__|.|__|__|</td></tr>
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<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|.|__|__|</td><td>|__|.|__|__|</td><td>|__|.|__|__|</td></tr>
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</table>

Codes for Quality of treatment (questions 15-17)

5 = very good
4 = good
3 = medium
2 = bad
1 = very bad

Section 5: Demand for health care (continued)

<table>
<tr><th rowspan="2">Rang</th><th>Initials of name of HH member</th><th>No. of health problem</th><th colspan="3">Costs of stay / daily living</th><th colspan="3">Costs of treatment / consultation</th><th colspan="3">Costs of medicaments and material used</th></tr>
<tr><th></th><th></th><th>1st</th><th>2nd</th><th>3rd</th><th>1st</th><th>2nd</th><th>3rd</th><th>1st</th><th>2nd</th><th>3rd</th></tr>
<tr><td>1</td><td>2</td><td>3</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td></tr>
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<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td></tr>
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<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td></tr>
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</table>

<u>Section 5:</u> Demand for health care (continued)

<table>
<tr><th rowspan="2">Rang</th><th rowspan="2">Initials of name of HH member</th><th rowspan="2">No. of health problem</th><th colspan="3">Other expenditures</th><th colspan="3">success of treatment</th><th rowspan="2">Have you been in hospital because of this disease ?
If yes, how long ?(D,W,M)
If no: next section</th><th rowspan="2">How much did you pay for the hospital?</th></tr>
<tr><th>1st</th><th>2nd</th><th>3rd</th><th>1st</th><th>2nd</th><th>3rd</th></tr>
<tr><td>1</td><td>2</td><td>3</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__| |__|</td><td>|__|__||__|__|__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__| |__|</td><td>|__|__||__|__|__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__| |__|</td><td>|__|__||__|__|__|</td></tr>
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<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__| |__|</td><td>|__|__||__|__|__|</td></tr>
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<tr><td>|__|__|</td><td></td><td>|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|__||__|__|__|</td><td>|__|</td><td>|__|</td><td>|__|</td><td>|__|__| |__|</td><td>|__|__||__|__|__|</td></tr>
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</table>

Codes 'success of treatment' (questions 36-38)

5 = totally cured
4 = partly cured
3 = relief
2 = no improvement
1 = worse than before

<u>Section 6:</u> Helpers of the sick person

During the illness episode of the respondent, did some HH members help/assist him/her ? If yes, fill in the table below.

<table>
<tr><td>Rank
|__|__|</td><td>Initials of sick person
________________</td><td>No. of health problem
|__|__|</td><td></td><td>Rank
|__|__|</td><td>Initials of sick person
________________</td><td>No. of health problem
|__|__|</td><td></td><td>Rank
|__|__|</td><td>Initials of sick person
________________</td><td>No. of health problem
|__|__|</td></tr>
<tr><td>Rank</td><td>Initials of helper / assistant</td><td>Time lost (H,D,W)</td><td></td><td>Rank</td><td>Initials of helper / assistant</td><td>Time lost (H,D,W)</td><td></td><td>Rank</td><td>Initials of helper / assistant</td><td>Time lost (H,D,W)</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>Rank
|__|__|</td><td>Initials of sick person
________________</td><td>No. of health problem
|__|__|</td><td></td><td>Rank
|__|__|</td><td>Initials of sick person
________________</td><td>No. of health problem
|__|__|</td><td></td><td>Rank
|__|__|</td><td>Initials of sick person
________________</td><td>No. of health problem
|__|__|</td></tr>
<tr><td>Rank</td><td>Initials of helper / assistant</td><td>Time lost (H,D,W)</td><td></td><td>Rank</td><td>Initials of helper / assistant</td><td>Time lost (H,D,W)</td><td></td><td>Rank</td><td>Initials of helper / assistant</td><td>Time lost (H,D,W)</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
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<tr><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td><td></td><td>|__|__|</td><td></td><td>|__|__| |__|</td></tr>
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MODULE 3: PREVENTIVE CARE AND GENERAL HEALTH

Village |__|__| **Date of visit** |__|__| |__|__| |__|__|__|__|

Name of HH head ____________________________________ **HH ID** |__|__| |__|__|__| |__|

Name of interviewer ____________________________________ Code |__|__||__|

Section 1: Preventive care *(This section applies to every HH member)*

<table>
<tr><th>Rank</th><th>Name of HH member</th><th>In the last 3 months, did you use any preventive care (from the list I'm going to read to you now)?
Yes / No

If yes Col 5
If no End</th><th>No. of preventive care</th><th>What kind of preventive care was it ?</th><th>Who did you consult ?</th><th>Where ?</th><th>Why this choice ?</th><th>Duration of travelling there in hours</th><th>Judge on the quality of treatment you got</th></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
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Code for preventive care (question 5)

Vaccinations
BCG = BCG (Tuberculoses)
POL = Polio (Poliomyelitis)
DTC = DTC (Diphtheria, Tetanus, Whooping cough
ROU = Measles
FIE = Yellow fever
TET = Tetanus
MEN = Meningitis
AUV = Other vaccination

Code 'Who did you consult ? (Question 6)

MOM = self-treatment
FAM = family member
AMI = friend, neighbor
INF = nurse
MAT = matron
PHA = pharmacist
SAG = midwife
ASV = village health worker
MED = medical doctor
GUE = traditional healer
AUP = other persons

Codes Place of treatment (question 7)

MAI = at home
VIL = this village
AVI = other village
CHD = Dédougou hospital
CMD = Dédougou central hospital
NNE = external consultation at Nouna hospital
CKO = CSPS of Koro
CBO = CSPS of Bourasso
CDA = CSPS of Dara
CTO = CSPS of Toni
NCO = Nouna hospital
AUT = Other

Code Why this choice ? (question 8)

ARG = not enough money for something else
CON = trust in his/her competence
PRO = nearest health service
AUT = other reason (specify)

Code Quality of treatment (question 10)

5 = very good
4 = good
3 = medium
2 = bad
1 = very bad

Section 1: Preventive care

Rank	Name of HH member	No. of preventive care	Costs of transportation	Costs of the stay	Costs of treatment/ consultation ?	Costs of medicaments and material	Other costs	If you had any costs, how did you cope with them ?	Do you use family planning ? Yes / No	If yes, what methods do you use ?
1	2	3	11	12	13	14	15	16	17	18

Codes money arrangements (question 16)

1 = selling goods/animals
2 = received free treatment
3 = received money as a gift
4 = borrowed money
5 = used cash, liquid savings
6 = worked for the money
7 = other (specify)

Codes family planning (Question .18)

AUC = nothing
DIU = DIU/coil
INJ = Injection
MGC = Mousse/Gel
MTR = traditional methods
STF = female sterilization
STM = male sterilization
ABS = Abstinence
CON = Condom
AUT = other

MODULE 4: ANTHROPOMETRICS

Date of visit |__|__| |__|__| |__|__| **Village** |__|__| **HH ID** |__|__| |__|__|__|__| |__|

Name of household head _____

Name of anthropometrist _____ **Code** |__|__|__|

No.	Name of HH member	Weight (in kilograms)	Height (in cm)
01		|__|__|,|__|	|__|__|__|
02		|__|__|,|__|	|__|__|__|
03		|__|__|,|__|	|__|__|__|
04		|__|__|,|__|	|__|__|__|
05		|__|__|,|__|	|__|__|__|
06		|__|__|,|__|	|__|__|__|
07		|__|__|,|__|	|__|__|__|
08		|__|__|,|__|	|__|__|__|
09		|__|__|,|__|	|__|__|__|
10		|__|__|,|__|	|__|__|__|
11		|__|__|,|__|	|__|__|__|
12		|__|__|,|__|	|__|__|__|
13		|__|__|,|__|	|__|__|__|
14		|__|__|,|__|	|__|__|__|
15		|__|__|,|__|	|__|__|__|
16		|__|__|,|__|	|__|__|__|
17		|__|__|,|__|	|__|__|__|
18		|__|__|,|__|	|__|__|__|
19		|__|__|,|__|	|__|__|__|
20		|__|__|,|__|	|__|__|__|