COLLECTION OF BIOGRAPHICAL DATA IN ANTANANARIVO

The Biomad98 survey

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While it does not purport to perform all the functions of an observatory of employment and household living conditions, the biographical survey conducted in Antananarivo and its suburbs in 1998 provides a microcosm of the economic and social developments of the previous thirty years. The main purpose of the survey was to identify the effects of impoverishment and market opening on the dynamics of the urban job market and on the living conditions of households, analysed in terms of access to housing, family structures and demographic trends. After a general presentation of the survey, this report describes the four sections of the questionnaire and their layout. We shall then proceed to an evaluation of the collection process before presenting some of the findings.

The biographical survey conducted in Antananarivo in 1998 (Biomad98) was a collaborative effort involving two teams from the *Institut de recherche pour le Développement* (IRD), formerly known as Orstom; one consisted of economists, the other of demographers. The survey was conducted in response to a proposal made in the framework of the Madio project at the *Centre français sur la Population et le Développement* (CEPED) for the addition, in 1998, of a biographical component to the annual Antananarivo employment survey with a view to analysing in greater detail the link between employment and the other aspects of people's lives.

The aims of the Biomad98 survey

From the perspective of the Madio project, the biographical survey was one of the supplementary surveys that had been grafted onto the annual employment survey on the same basis as the surveys on the informal economy and household consumption (stages 2 and 3 respectively of the three-part 1-2-3 Survey) or the survey on health, education and transfers between households (Set97). Like these other operations, the biographical survey was designed not only to analyse the situation in Antananarivo but also to disseminate the compilation methodology for the benefit of Instat, the national statistical office of Madagascar, in order to strengthen the national statistical machinery.

The biographical survey benefited greatly from the mechanism for conducting statistical surveys which had been established by the Madio project; this enabled the survey team to reduce the time and expense involved in sampling and to make use of an existing team to carry out the selection, training and organisation of the interviewers for the collection and recording of data.

While the biographical survey does not purport to perform all the functions of an observatory of employment and household living conditions, it does serve to

portray a microcosm of the economic and social developments of the previous thirty years. By using the same collection, recording and analysis structure as surveys conducted in other African countries, Biomad98 was able to come up rapidly with comparable scientific findings to those of similar surveys conducted in other African capitals, namely Dakar, Bamako and Yaoundé (Antoine, Bocquier, Fall, Guissé and Namitelamio, 1995; Ouédraogo and Piché, 1995; Antoine, Ouédraogo and Piché, 1998; Antoine and Bocquier, 1999; Kouamé, Beining, Gueye, Kuepié and Kishimba, 1999). It was one of a wave of surveys designed to renew the system for the collection of demographic data on geographical and social mobility (*Groupe de réflexion sur l'approche biographique*, 1999).

The analysis of biographical data makes it possible to measure the medium and long-term effects of economic trends (wage reduction, changes in trade policy, etc.) on the dynamics of the job market and on the structure and living conditions of households. The economic situation in Madagascar had been characterised by a significant fall in living standards since the sixties (Ravelosoa and Roubaud, 1996), followed by an economic recovery in the second half of the nineties (Razafindrakoto and Roubaud, 1998). The main aim of the Biomad98 survey was to identify the effects of impoverishment and market opening on the dynamics of the urban job market and on access to housing and family structures. In order to achieve this aim, the team analysed the various components of the integration process in the urban environment: access to housing, job opportunities, the structure of households and demographic trends. This type of approach makes it possible to understand the interactions between people's family situation and their housing and employment histories.

The sampling method

Main characteristics of the sample

The Biomad98 survey was conducted in conjunction with the 1998 employment survey (stage 1 of the 1-2-3 Survey). The Biomad98 sample is a subsample of individuals who had responded to the employment survey.[1] The sample for the biographical survey, in other words, was drawn from among the 13,442 household members who responded to the 1998 employment survey.

The Biomad98 survey focused on the lives of three age groups: those born between 1943 and 1952 (aged 45 to 54 at the time of the survey), those born between 1953 and 1962 (aged 35 to 44) and those born between 1963 and 1972 (aged 25-34). These three age groups have experienced different economic and social conditions during the course of their housing and employment histories and their marriages and partnerships. So that they could draw comparisons between the sexes and between the age groups, the team decided to survey the same number of individuals in each category. Since the size of the total sample

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[1] See the article by Faly Rakotomanana, Éric Ramilison and François Roubaud on the annual employment survey in Greater Antananarivo in issue 27 of InterStat

had been set at 2,400 from the beginning – essentially for budgetary and organisational reasons – this meant trying to obtain 400 male and 400 female respondents from each of the three age brackets.

The sampling quotas to be applied for each age category were estimated on the basis of the distribution by age and sex of the individuals who responded to the 1997 employment survey (Rakotomanana, 1997). On the basis of these figures, the sampling quotas for the three age categories were as follows:

- all of the individuals in the 45-54 age bracket were included in the subsample;
- in the 35-44 age brackets, every second person was selected from the list of eligible individuals in order to obtain the target subsample size;
- in the 25-34 bracket, one individual in three was selected from the list.

Practical details of the selection process

In order to select the subsample for the Biomad98 survey, the team had to wait for the returns from all respondent households in the employment survey to obtain the list of individuals in households and their characteristics from which the sample for the Biomad98 survey could be selected.

In order to comply with the timetable of surveys for the Madio project and to avoid the loss of respondents, it was decided that the Biomad98 would begin only one week after the start of the employment survey. This short gap meant that the Biomad98 sample had to be selected as the completed questionnaires for the employment survey were received. The Biomad sample was therefore put built up gradually rather than being selected at one sitting as is normally the case.

In order to avoid the need to resort to selection of the sample by the interviewers themselves, an 'automatic' selection mechanism was established to cover the entire period of the surveying operation. This mechanism comprised three stages.

Logging information from the employment survey

Twice a week, two operators logged data from the employment survey that would serve to identify and permit contact with prospective respondents: identification number, full name, address and, of course, age and sex. They also recorded the number of the collection team for the employment survey in order to facilitate the allocation of selected individuals to the field teams for the biographical survey.

Checking collected data

Given the time constraints, double logging of data was not possible. The collected information was therefore open to error. Moreover, the data from the employment questionnaires were still provisional, i.e. they had not been

validated. It was therefore important to carry out at least a minimal check on the collected information before selecting the subsample. To this end, a short computer program of cross-checks was devised to verify that the relevant variables, particularly age group and sex, had been properly categorised, that all the identification numbers had been logged and that no items of information were counted twice. This program enabled the operators to detect and correct a number of errors but, unfortunately, not all of them.

Selection of the Biomad98 sample

Following the operations described above, a partial survey base was obtained, corresponding roughly to the number of responses to the employment survey received in a three-day period. The selection was made from this list of individuals as follows:

- the list was sorted by sex, age group and identification number;
- the initial list was divided into six strata by sex and age group;[2]
- one in two of the middle age group and one in three of the youngest age group were systematically selected, and every member of the oldest age group was selected;
- the sample was sorted by team number, sex, age group and identification number;
- other individuals were selected for a reserve list.

The biographical questionnaire

The Biomad98 survey was a retrospective survey in which all the respondents retraced key events in their lives from birth to the data of the survey. The principle underlying biographical questionnaires is that they should focus on those aspects of individuals' lives which change over the course of time where such changes can be recalled and dated. The questionnaire for the Biomad98 survey was divided into four sections:

The section devoted to the individual's **housing history** recorded moves between different localities and dwellings as well as changing household situations and traced the development of the amenity level of the various dwellings in which the individual had lived.

The section on **training and employment** retraced the individual's full education and training history and employment history.

The section on the individual's **marital history** recorded the various types of partnership in which the individual had lived (cohabitation, customary

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[2] The sample was stratified by sex in order to avoid any sampling bias at the selection stage. In fact, the list of identification numbers was ordered in such a way that the number allocated to the householder (often a man) was generally followed by that of his or her spouse.

marriage, civil and religious marriage) as well as changes in the individual's legal status and changes between living with and living apart from his or her partner.

The section on the respondent's **reproductive life** recorded all live births and deaths of his or her children.

The Agévén form

A document known as the *Agévén* (from *âge* + *événement*) form enabled interviewers to see at a glance the life history of each respondent (Antoine, Bry and Diouf, 1987). The form listed the main events in the respondent's life and the dates on which they occurred. Although it was not designed to be logged electronically, the form made it far easier to conduct the interviews, and respondents were asked to complete it before filling in the questionnaire proper.[3]

The *Agévén* form provided a chronological classification of the various events in the respondent's life: family events, moving home, migration and occupational events. Each of these occurrences was reported in one of the three columns of the *Agévén* form (see box and illustration below).

The first column relates to the **main demographic events** in the respondent's life (respondent's and children's dates of birth) and **marital events** (marriages, divorces and spouse's death). Each event is identified on the left of the column and must be followed by its serial number, the forenames of the child or spouse and, if possible, the exact date of the event. A cross is entered in the time axis in the centre of the column in order to relate each event to the calendar printed on the left of the *Agévén* form. For a divorce (marked 'D') and the death of a spouse ('V'), the serial number is the same as for the corresponding marriage ('U'). For live births (marked 'N'), only the number representing the child's seniority ranking in the respondent's family is noted (1 = eldest child). Changes in marital status feature on the right of the column, provided they are at least six months apart. Two types of change in marital status are recorded, namely changes in the nature of the marriage (customary marriage or civil/religious marriage) and occasions when the respondent ceased to live with his or her spouse or when the two spouses moved together again. Cohabitation is also recorded, and periods when partners lived apart are recorded whether they separated by choice or were forced apart by events beyond their control.

The second column concerns **places of residence**. Towns and villages outside Antananarivo, as well as districts of Antananarivo where the respondent has lived, are recorded here. The names of these places feature on the left of the time axis, while changes in status are recorded to the right of the time axis,

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[3] This form was altered from previous models (Antoine et Bocquier, 1999) in order to take account of changes of status within a single dwelling (people who stay in their parents' house and subsequently become houseowners by inheritance), within a single household (change in a person's relationship to the householder) or within a single company (as a result of promotion).

provided they are separated by a period of at least six months. Two types of change in status are recorded here: changes in a person's status with regard to his or her dwelling (lodger, tenant or owner) and changes of status within the household in terms of the respondent's relationship to the householder.

The third column serves to record all **changes occurring during the respondent's education and occupational activity** (from employment to unemployment and *vice versa*), **changes of workplace and changes in the respondent's status within the workplace**. The chronological sequence contains only the respondent's primary activities. Changes of school or workplace are recorded on the left of the column. Changes in the respondent's status within the school or workplace are recorded on the right of the time axis, but no more than one change is recorded in any six-month period. Two types of change in status are recorded: changes in the level of education received (primary, secondary, further and higher education) and changes in occupational status in the workplace (e.g. trainee, labourer, foreman, etc.).

The *Agévén* form allows for the recording of events for which an exact date can be given as well as those that can only be ordered chronologically. It can also record periods of known duration in the respondent's life as well as periods that can only be dated by reference to particular events.

Box The life of Thierry *(see illustration below)*

Thierry was born in Behenjy in May 1952. In 1959, he began his primary education at a state school and continued it at a private Catholic school from 1963 onwards. He left school in 1966 after moving to Antananarivo to join his parents. He began training as a mechanic in that same year. In September 1972, he joined the Solima company as a qualified mechanic. Thierry married Marie (U_1) in a customary marriage ceremony in March 1974, and the civil and religious ceremonies were held in December 1978. Three children were to be born of this marriage – Joseph in February 1976 (N_1), Faly in October 1980 (N_2) and François in June 1983 (N_3).

Until July 1976, Thierry had always stayed with his parents. In July 1976, two years after his marriage, he was transferred by his company to Antsirabe, where he rented a dwelling. During his time at Antsirabe, his company promoted him to foreman (1981). At the beginning of 1990, however, he lost his job. In that same year he decided to return to Antananarivo. Since 1988, he and his wife had been living apart. They were divorced in 1990 (D_1). Alone and unemployed, he returned to live with his parents.

In June 1992, he decided to set up in business as a mechanic. Some time later, he met Alice, and in 1994 she came to live with him (U_2). In June 1994, Thierry's father died, and Thierry inherited the family dwelling, thereby becoming a homeowner. In 1995, he married Alice in civil and religious ceremonies, and in March 1996, she gave birth to Alain, Thierry's fourth child (N_4). In January of the same year, Thierry had expanded his business by hiring an employee.

On the following page is an example of a completed *Agévén* form, based on Thierry's life history.

SEGMENT /__/__/__/__/__/ MENAGE /__/__/__/ IND /__/__/ AGEVEN Enquête BIOMAD-1998

Histoire	An.	Dur.	FAMILLES	statut	RESIDENCES	Statut	ACTIVITE	statut
	1998	0						
	1997	1		Civil et		C.M.		Employeur
	1996	2	N_4 Alain *(03)*	religieux		Propriétaire	Mécanicien	*(01)*
Incendie	1995	3		*(99)*	Tananarivo		A son compte	
	1994	4	U_2 Alice *(02)*	Union libre		*(06)*		Indépendant
	1993	5						
	1992	6				Hébergé		*(06)*
Grèves	1991	7				par parents		Chômage
	1990	8	D_1 Marie *(88)*		*(66)*			*(33)*
Elec.prés	1989	9		Séparés				
	1988	10		*(99)*				
	1987	11						
	1986	12						Chef d'équipe
	1985	13						Mécanicien
	1984	14		Civil et		C.M.		
	1983	15	N_3 François *(06)*	religieux		Locataire		
Elec.prés	1982	16			Antsirabé		SOLIMA	
	1981	17						*(99)*
	1980	18	N_2 Faly *(10)*					
	1979	19						
	1978	20		*(99)*				
	1977	21						Ouvrier
	1976	22	N_1 Joseph *(02)*	Coutumier	*(07)*			Mécanicien
Rév.démo	1975	23						
	1974	24	U_1 Marie *(03)*					
	1973	25						
Evénem.	1972	26				Hébergé par		*(09)*
	1971	27			Tananarivo	parents		
	1970	28					Entreprise	Apprenti
	1969	29					informelle	mécanicien
	1968	30						
	1967	31						
	1966	32			*(33)*			*(88)*
	1965	33					Ecole privée	Primaire
	1964	34					catholique	
	1963	35						
	1962	36					Ecole	
	1961	37					publique	Primaire
Indépend.	1960	38				Hébergé par		
	1959	39			Behenjy	parents		
	1958	40						
	1957	41						
	1956	42						Inactif
	1955	43						
	1954	44						
	1953	45						
	1952	46	N Thierry *(05)*					
	1951	47						
	1950	48						
	1949	49						
	1948	50						
Insurrec.	1947	51						
	1946	52						
	1945	53						
	1944	54						
	1943	55						
	1942	56						

The four sections of the questionnaire

Each of the four sections of the questionnaire comprised several columns, corresponding to periods in the life of the respondent which are defined on the *Agévén* form.

The section on the respondent's housing history

In this section, the periods defined in the *Agévén* form corresponded to the time spent by the respondent in a given dwelling without any intervening change in his or her occupational or household status. For each of these periods, the logged information related to the type of dwelling and the conditions of occupancy.

A number of questions on the material used to build the walls and on access to water and electricity enabled the research team to determine whether and how the amenity of the dwelling developed between the beginning and end of the respondent's occupancy.

Specific questions were asked for each of the three forms of occupancy status considered in the survey (owner, tenant, lodger). A distinction was made between individual and joint ownership (with spouse, family, etc.), whether with or without legal title; another question concerned the means by which ownership was acquired (inheritance, purchase, etc.). Various types of tenancy were also identified (renting with an eventual right of purchase, renting from an employer, subtenancy and normal tenancy). Lastly, the questionnaire asked respondents who were lodgers to categorise the person lodging them and their own occupancy status.

The section on the respondent's educational and occupational history

The purpose of this section was to retrace the respondent's educational history through the various stages of the education process and the establishments attended as well as his or her occupational history through changes of workplace and changes in occupational status. This section was far more refined than in previous biographical surveys.

For each period of schooling or study, identified in terms of a specific stage of the education process spent at a particular establishment, the main information logged by interviewers concerned the type of establishment attended (state or private, religious or secular). Another question related to the person responsible for the care of the respondent during each stage of the education process.

For the sake of comparability, the description of each period of activity was designed to match very closely the information categories used in the employment survey. By using the same categories, interviewers were able to follow long-term employment trends.

In principle, only periods of activity exceeding six months were taken into account in the biographical survey. We did, however, introduce a question on

jobseeking periods which included periods of less than six months with a view to assessing more accurately how long it was taking unemployed people to find work.

For periods of self-employment (as sole traders or employers), our questions related to the resources used to set up in business (loans, family members, associates, etc.) and to the type of accounting system used (personal bookkeeping, standard accounting practice or no accounts kept).

Periods spent in paid employment or vocational training or as an assisting family member gave rise to specific questions about how the respondent obtained his or her job, the respondent's broad socio-professional category, training received during the period in question, whether the respondent receives pay slips and has been given a contract (in order to assess whether the business belongs to the formal or the informal economy), how often the respondent is paid, the number of hours worked per week and various benefits received.

Finally, some questions were designed to find out reasons for job changes as well as information on secondary employment.

Women respondents were asked specific questions on the use of an assistant for household tasks, whether paid or unpaid, including assistance from family members.

The section on the respondent's marital life

It should be emphasised that this was an innovative section, especially in relation to previous surveys. For every union with a partner, a distinction was made between the various stages of formalisation of marriage (customary, civil and religious marriage ceremonies); periods of cohabitation outside marriage were also recorded, as were periods when spouses lived apart. In this way the team was able to retrace the entire dynamics of the respondent's conjugal life. In addition, information was collected on the partner's ethnic origin and religion and on his or her age, education level and marital status. Despite the fairly small number of questions (17), their relatively complex structure explains why the interviews on this section tended to be lengthy.

The section on the respondent's reproductive life

This was the most straightforward section of the questionnaire, with only seven questions on each of the respondent's children. It enabled interviewers to gather data on the fertility of the respondent and on cases of infant mortality among his or her children. This section also featured information on the union from which each child had come and thus served as a link between the analyses of the respondents' descendants and of their marital life.

Organisation of operations and evaluation of the collection process

Collection of biographies in the field

Recruitment and training of data collectors

At the start of the Biomad98 survey, the collection staff comprised 12 supervisors and 36 interviewers, each supervisor being assigned a team of three interviewers. During the field operations, additional field workers were recruited to reinforce some of the teams with particularly heavy workloads and to stand in for interviewers who failed to appear. In the end, a total of 41 interviewers worked on the survey.

The supervisors and interviewers had relatively high levels of educational attainment. Only three of them had not studied beyond the level of the highest school qualification, the *baccalauréat*, and the others all had a degree from an institution of higher education. Three quarters of the collection staff were women.

The training of supervisors and interviewers was divided into two parts: a course of theoretical training and a practical course in the classroom (completing forms on the basis of fictional biographies and conducting simulated surveys). A first written test was held at the end of the training courses to assess the knowledge assimilated by the trainees. The results of a second test – a field test – served as the basis for the selection of supervisors.

Progress of the field operations

When the collection staff took their tests, it became apparent that there were certain gaps in their knowledge and that concepts relating to the biographical survey had not been properly grasped in some cases. Moreover, the employment survey had had to be delayed by two weeks for various reasons (the electoral timetable, an increase in civil servants' pay, etc.). This resulted in the postponement of the Biomad98 survey, leaving a void between the end of training and the start of the field work. It was therefore decided to give a refresher course just before the field operations in order to go back over the main concepts of the survey that had not been properly grasped, particularly in the domain of employment.

The survey, which began on Saturday, 4 April 1998, was scheduled to last for seven weeks. The management team accompanied all the survey teams in the field, lending special support to those that appeared to be weakest on the basis of the test results.

Each team worked in collaboration with the team surveying the same geographical area for the employment survey so that they could more easily identify and locate the individuals selected for the biographical survey.

During the collection process, two meetings a week were organised between the supervisors and the survey management team to monitor the progress of the

field work, to resolve jointly the problems encountered by each team with a view to compiling a catalogue of harmonised solutions for all the teams and to distribute the sample among the teams. The management team performed manual checks for inconsistencies in the collected data. They conducted counter-enquiries in respect of each interviewer in order to satisfy themselves as to the plausibility of the information contained in the completed questionnaires. Lastly, they also went out into the field to resolve problems arising from refusals to cooperate and unidentifiable households or individuals.

Length of the biographical interview

A frequent criticism of biographical surveys is that they require excessively long interviews. We wanted to check this assertion and to identify the optimum collection strategy on the basis of the experience obtained in the course of the Biomad98 survey.

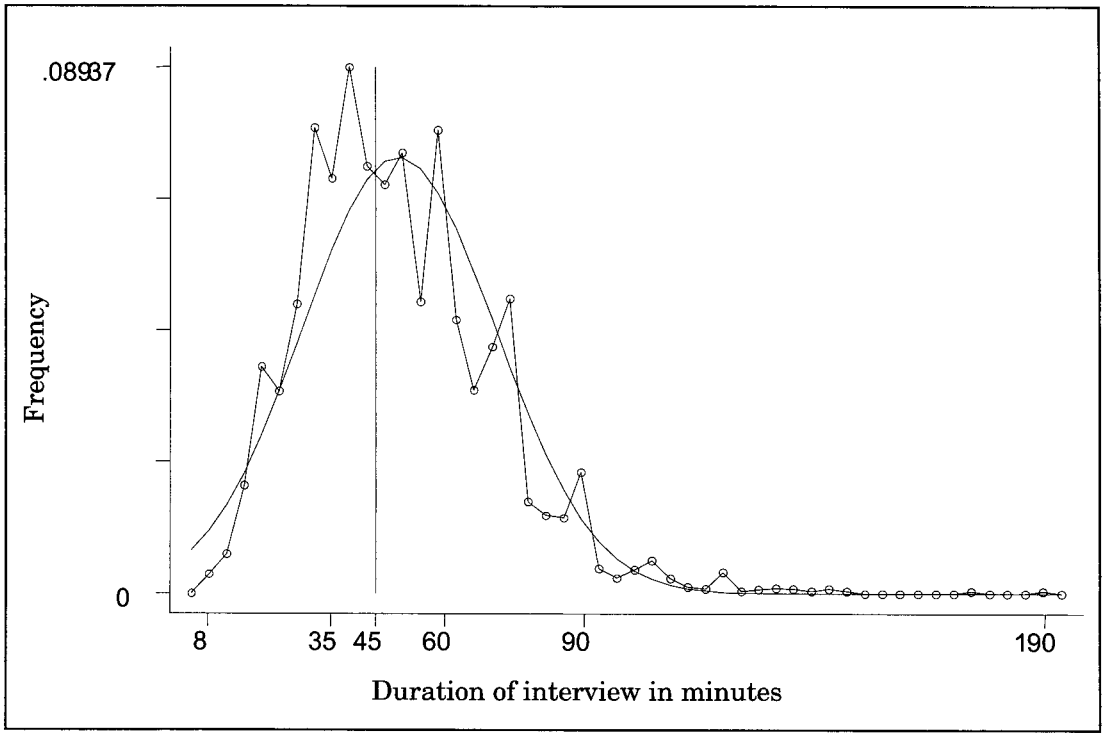
For each completed questionnaire, the interviewer was asked to note the exact starting and finishing times of the interview. In this way it was possible to calculate the length of the biographical interview, which involved completing both the *Agévén* form and the biographical questionnaire proper.

It emerged that the length of the biographical interviews followed a more or less normal distribution curve with a wide dispersion from the shortest and the longest interview (8 minutes to 190 minutes – see Diagram 1 below). The median, however, was only 45 minutes, and 50% of the interviews lasted between half an hour and an hour. Lengthy interviews were fairly rare: 10% of the interviews (fewer than 250 biographies) lasted longer than an hour and a half. Most of the interviews were therefore completed within a reasonably short time, and there was no evidence that the interviews for biographical surveys are significantly longer than those for other socio-demographic surveys.

In order to identify the determinants of interview time, we performed a regression analysis based on the aforementioned median interview length.

The number of columns to be completed in each section of the biographical questionnaire is an indication of the complexity of the individual's life history. The results of the regression analysis show that each column in the sections on the respondent's housing history and educational/occupational history require slightly more than a minute of interview time. This led to a wide variation in the time spent on these sections from one interviewee to another, since the number of columns, representing the periods of the respondent's life identified in the *Agévén* form, could vary from one to twenty-one. The section on the respondent's marital life is quite complex, and the average time needed to complete each of the columns in that section worked out at 2.7 minutes; however, the maximum number of columns completed in the marital section – each column representing the respondent's union with a particular partner – was only four. As for the section on the respondent's reproductive life, it required an average interview time of 0.4 of a minute per column, i.e. per child. The highest number of columns completed in this section at any interview was 14.

Diagram 1 Distribution of interview length and normal distribution curve



Source: Biomad98 survey; Instat, Madio.

The age of the respondent is also an indicator of the complexity of his or her life history, and older respondents also experienced more difficulty in recalling past events. But although the regression coefficient was significant, an age difference of ten years corresponded to a difference of only 2.5 minutes in interview length. This meant that the oldest respondents (aged 54) took about 7.5 minutes longer to interview than the youngest (aged 25). In addition, interviews with women were not significantly shorter than those with men.

The experience accumulated by interviewers in the course of the survey had the effect of reducing the length of interviews. Between the first and the eighth week of the survey, average interview times had been reduced by more than a quarter of an hour. An increase in the length of interviews was recorded during the ninth and tenth weeks, but these interviews were only conducted with respondents with whom it had been difficult to make an appointment, and more difficulties were always liable to be experienced in these interviews. Between the eighth week and the tenth week, only 71 interviews – less than 3% of the total number – were conducted.

In fact, the main cause of variations in the length of interviews turned out to relate to the interviewers themselves. The identity of the interviewer accounted for 35% of the variation, as against only 14% for the complexity of the respondent's life history (measured by the number of columns to be completed), 6.5% for the week in which the interview took place (shorter interviews as

experience was accumulated), 2% for the age of the respondent and 0.1% for the sex of the respondent.

Once we had controlled for the other determinants, it turned out that the length of the interview could vary by more than an hour between the slowest and the fastest interviewer. It should, however, be noted that some interviewers proved particularly slow. If the seven least efficient interviewers are taken out of the equation, the gap between the fastest and the slowest interviewer is reduced to slightly more than half an hour.

The fastest interviewer had completed her education with the *baccalauréat*, while the slowest interviewers had spent at least four years in higher education. Their level of educational attainment, in other words, was no gauge of efficiency in the field. On the contrary, the results of the regression analysis showed that the more highly qualified interviewers actually tended to be slower than those with fewer qualifications, although the tests were not significant. It was also noticeable that the interviewers who only had the *baccalauréat*, in other words the ones who tended to conduct their interviews more quickly, were all women.

Paradoxically, those with previous experience of survey work seemed to take longer for their interviews, although the difference was not significant. It may be that some interviewers had acquired habits from previous surveys that they found difficult to break. The biographical survey is actually a very distinct type of survey, differing from other types in which the reconstruction of past chains of events either does not feature or is less crucial, and this might have disconcerted some of the experienced interviewers. This point has already been raised in connection with other biographical surveys (Groupe de réflexion sur l'approche biographique, 1999).

The characteristics of the interviewers, such as their age, sex and qualification level and their experience in conducting surveys, did not provide an adequate explanation of variations between interviewers. There is a residual effect that is unique to each interviewer. In short, other elements of the interviewer's personality which were not researched had influenced the length of the interviews they conducted.

The regression analysis also showed wide variations within teams; in other words, the length of an interview did not seem to depend on a team policy or a supervisor's instructions.

These results confirm that it is preferable, when conducting biographical surveys, to recruit fewer interviewers, to select them more strictly on the basis of their performance in a field test on a biographical questionnaire rather than their qualification level or past experience and to employ them over a longer period. On the basis of an analysis of the first questionnaires completed in the field, it would be possible, with the aid of the type of statistical analysis described above, to eliminate the least efficient interviewers. In this selection exercise, account would have to be taken not only of the speed of the interview but also of the interviewer's ability to record information properly, which we have not considered here.

When it comes to determining the duration of a survey, there is also a need to consider the fatigue factor among interviewers: an excessively lengthy survey impairs the quality of the completed questionnaires and increases the risk of cheating. We should add that a binding timetable (the Biomad98 survey had to be completed before other surveys in the Madio project could begin) compelled us to limit the scheduled duration of Biomad98 to seven weeks. Nevertheless, with a view to improving the future collection of data, we venture to estimate that the optimum duration of a biographical survey such as Biomad98 would be ten weeks, excluding the few questionnaires that would be completed after the closing date. We estimated that the average interviewer completed about nine biographical questionnaires a week, which means that, over a ten-week collection period, the number of interviewers could have been reduced to 27 or 28, instead of 36; this means that there could have been nine teams of three interviewers or seven teams of four, each team being managed by a supervisor.

Logging and validation of biographical data and preparation of case files

Logging and validation

In view of the special nature of the Biomad98 survey, the input mask programmed for the logging of data had to differ from those used for the surveys that are normally processed by Instat. Most of the logging was performed by about ten specially recruited operators. For material and budgetary reasons, the normal process of double-logging was not carried out. The data from one third of the questionnaires were logged directly, while the remaining two thirds were coded on separate sheets before being logged. The logging of all information from the questionnaires was completed within a month.

The validation process began with an automatic check to verify the consistency of the data, which were corrected if necessary. To this end, a number of consistency tests, comprising traditional exhaustiveness tests and double counting, as well as internal consistency tests for each section of the biographical questionnaire, were programmed. To complete this validation process, it was necessary to check for consistency between individuals' case files for the Biomad98 survey and the corresponding files for the employment survey (verification of particulars and correction of inaccurately logged personal details). A month was needed for a programmer to write this program. The tests made it possible to detect coding and input errors as well as mistakes in the completion of questionnaires, the correction of which sometimes necessitated a return visit to the respondent.

Merging the biographical files

Once the final data file was ready for use, a second series of tests was conducted. The aim of these tests was to verify the consistency of the dates assigned to events that were recorded in more than one section of the questionnaire. For this purpose, we created a biographical file by merging the four sections (housing, educational/occupational, marital and reproductive

histories) into a single chronological sequence. So the four sections were effectively logged as four separate files to begin with and were then merged into a single file listing all the events in the respondent's life from birth to the time of the survey. This final file showed details of the individual's residential, occupational and marital situation at any given time, along with the number of his or her children (live births, children who had died and surviving children).

The merging program that was used is relatively long and complex. Experience gathered from previous biographical surveys proved beneficial, and the merging process took about three weeks of intensive work, a considerably shorter period than had been required in the previous biographical surveys.[4] Finally, the definitive validated file was obtained less than three months after the completion of data collection in the field.

Evaluation of the collection process

However much care is taken in the collection of data, they will inevitably contain errors. An evaluation of the collection process is therefore essential.

Difficulties arising from the linkage with the employment survey

The linkage with the employment survey was a barrier to the proper harmonisation of the collection process for the Biomad98 survey. It meant that the number of individuals allocated to a team varied from 190 to 240, because the structure of the sample by age and sex was not uniform from one survey area to another. Five extra interviewers had to be recruited to reinforce the overstretched teams, a situation exacerbated by the fact that three interviewers and three supervisors had to abandon the survey because they had found other jobs. In addition, the services of one supervisor were dispensed with because he was not managing to perform his assigned duties; his work was distributed among the other supervisors.

The organisation of the work of each Biomad98 team was also determined by the work performed by the employment-survey teams, which meant that two teams were unable to start until a week after the others had begun their activities. Most of the Biomad98 teams were also confronted with problems arising from a shortage of maps, since some of the supervisors from the employment survey did not pass on all the maps of their respective areas. Difficulties were also noted in finding the selected dwellings and household members.

Problems relating to the implementation of the sampling plan

Of the 2,533 individuals who theoretically belonged to the sample selected in accordance with the procedure described above, 258 were not actually interviewed for biographical data. Individuals who had taken part in the

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[4] The merging work was also made easier by the fact that the collection of information concerning the dates of the various events was rather better than in previous surveys.

employment survey were lost to the Biomad98 survey for various reasons: travelling, moving house, migration, illness, disability, etc. For occupational reasons, some people also proved impossible to contact throughout the course of the collection period. In addition, some people categorically refused to be interviewed when the Biomad98 interviewers called on them. In some cases, which were fortunately few in number, interviewers were turned away and verbally abused when they paid their first call.

In order to obtain the desired number of life histories, it was desirable to replace those individuals who, though theoretically part of the sample, could not actually be interviewed. These replacements were made within each of the survey areas, the age group and sex of the substitutes the same as those of the individuals they replaced. It was not possible to select substitutes for people in the 45-54 age group, because, as we mentioned above, everyone in that age group who was interviewed for the employment survey had to be interviewed again in the Biomad98 survey. This meant that there were reserve lists for the two younger age groups only, from which 59 substitutes were selected in the 25-34 age bracket and 69 in the 35-44 bracket. Slightly fewer women (57) than men (71) had to be replaced. In the sample as a whole, the 128 replacements that were made corresponded to a replacement rate of 5.1% of the theoretical sample and 5.3% of the actual final sample.

Table 1 Distribution of respondents by age group and sex

	Men	Women	Total	%
Birth years 1943-52	410	439	849	35.3
Birth years 1953-62	413	425	838	34.9
Birth years 1963-72	347	369	716	29.8
Total	1,170	1,233	2,403	100.0

Not all of the individuals who were not interviewed were replaced by substitutes. In 78% of these cases (101 cases out of 130), the person originally selected for interview was in the oldest age bracket, compared with 12% in the youngest and 10% in the middle age group. By the time the survey was completed, the life histories of 2,403 individuals had been charted (see Table 1 above).

The difference between the composition of the theoretical sample and the sample of individuals who were actually interviewed is at the root of a potential bias in the results obtained. The danger of a bias is made all the greater by the fact that the lost interviewees, i.e. those in the theoretical sample who were not interviewed, have different characteristics from those who were interviewed. In other words, the analysis is liable to be biased if the individuals who were actually interviewed could, because of their socio-demographic characteristics, differ in their housing, occupational and marital patterns from the members of the theoretical sample.

On the basis of the exhaustive list of individuals in the theoretical sample and their basic socio-demographic characteristics which were recorded in the employment survey (sex, age, marital status, relationship to the householder, ethnic origin, religion, occupation, place of residence and level of educational attainment), it was possible to assess which personal characteristics were most strongly affected by the changes in the composition of the sample group. To this end, we performed a logistical regression analysis to determine the risk of not being interviewed for a member of the theoretical sample. By introducing into the same regression analysis all the variables that could explain why an individual was not interviewed, this method makes it possible to assess the impact of each variable in isolation from the others. The characteristic with the highest incidence was taken as the reference characteristic for each explanatory variable (see Table 2 below).

It emerged that persons not in active employment[5] (retired persons, invalids, sick persons, etc.) were 2.8 times more likely not to be interviewed than those in active employment, while unmarried persons were twice as likely not to be interviewed as married persons. Men were also 1.5 times more likely not to be interviewed than women. Conversely, people who had seven to ten years of formal education were 1.5 times more likely to be interviewed than those with less schooling. Similarly, the children of householders were 1.8 times more likely to be interviewed than householders themselves, all other things being equal. The variables that seemed to have no influence on the probability of being interviewed were age group, ethnic origin, religion and district of residence. Last but not least, we should mention that no significant bias resulting from occupational activity was detected. This seems to suggest that the occupational histories, which were among the key points examined in the Biomad98 survey, were obtained from a group with the same occupational structure as the theoretical sample.

To allow for the possible loss of prospective respondents, a reserve list was drawn up from which substitutes could be selected to replace persons from the theoretical sample who could not be interviewed, as described above. It would therefore be interesting to observe the effect of these replacements on the breakdown of the sample by socio-demographic characteristics, and this is done in Table 2 below. The first point to note is that, since it was not possible to replace members of the oldest age group in the survey, this group was quite appreciably underrepresented in the final sample (40.0% as against 41.9% in the theoretical sample). This, however, did not cause any problems in the analysis of the respondents' life histories, since the analysis involved comparisons within each of the age brackets.

As for the other variables, the comparison between the breakdown of the theoretical sample and the interviewed sample suggests that the loss of some interviewees and the replacement of others had a minimal effect. There is therefore every reason to believe that there is very little bias in the final sample

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5 Persons not in active employment represent a small proportion (about 3%) of the people covered by the survey.

for the Biomad98 survey, because it scarcely differs from the theoretical sample that was selected on the basis of the employment survey. This result is gratifying, because it means that the analyses of the life histories are not liable to be significantly biased.

Problems encountered in the administration of the questionnaire

On the whole, the interviewers grasped the logic of putting dates to events and the rationale of the biographical questionnaire. Some questions, however, turned out to be of little relevance or elicited information in a form that made it difficult to process. We can enumerate the main problems that were encountered in each section of the questionnaire.

The section on the respondent's housing history

The type of housing in which the respondents lived emerged as a rather irrelevant variable, and the interviewers often tended to fall back on the classification 'self-contained house'.

The concepts of tenant and lodger were redefined in the course of the field work, particularly for women living in their partner's house or flat. Some interviewers were unable to identify exactly the situations in which a change of occupancy status within the same dwelling should be deemed to have occurred.

The distinction between the categories 'cement/fired bricks' and 'unfired bricks', used to describe the walls of the house in which the respondent lived, often puzzled interviewers and interviewees, who did not really know the difference between these two types of building material.

The respondent's relationship to the householder was sometimes recorded the wrong way round: if the interviewee was the son of the householder, the interviewer would sometimes categorise him as a 'relative in ascending line' instead of 'child', because the questionnaire did not make it sufficiently clear that 'relative in ascending line' meant 'relative of the householder in ascending line'.

Table 2 Logistical regression analysis of the risk of not being interviewed during the Biomad98 survey for members of the theoretical sample, and distribution of the sample by socio-demographic characteristics

Explanatory variables	Categories	Probability ratio	Significance level [1]	Distribution by variables: Theoretical sample (N=2 533)	Interviewed members of the theoretical sample (N=2 275)	Sample actually interviewed (N=2 403)
Year of birth	1963-72	1.02	-	28.6	28.5	29.5
	1953-62	0.98	-	29.5	29.6	30.5
	1943-52	*reference cat.*		*41.9*	*41.9*	*40.0*
Marital status	*married*	*reference cat.*		77.6	78.3	77.9
	unmarried	1.97	**	12.7	12.2	12.9
	other	1.61	*	9.7	9.6	9.2
Ethnic origin	*Merina*	*reference cat.*		*88.1*	*88.1*	*88.0*
	other	0.84	-	11.9	11.9	12.0
Religion	Catholic	1.10	-	36.5	36.2	36.5
	Protestant	*reference cat.*		*61.1*	*61.3*	*61.1*
	other	0.42	-	2.4	2.5	2.4
Occupation	managerial employee	1.12	-	8.9	8.8	9.0
	skilled worker	*reference cat.*		*26.3*	*26.6*	*26.7*
	labourer	1.00	-	10.0	9.9	10.0
	employer	1.60	-	4.2	4.0	4.1
	sole trader	0.88	-	24.9	25.3	25.1
	assisting family member	0.80	-	3.2	3.3	3.3
	not in active employment	2.76	***	3.1	2.7	2.6
	housewife/ househusband	1.24	-	8.9	8.9	8.8
	student	1.21	-	2.3	2.1	2.2
	unemployed	0.94	-	8.3	8.4	8.3
Relationship to householder	*Householder*	*reference cat.*		*48.9*	*48.5*	*48.2*
	spouse	1.16	-	33.7	34.3	34.1
	child	0.57	*	10.0	10.1	10.4
	other	0.97	-	7.4	7.1	7.3
District of residence	Firaisana 1	1.14	-	17.0	16.8	17.0
	Firaisana 2	1.08	-	14.5	14.3	14.3
	Firaisana 3	1.30	-	12.6	12.2	12.4
	Firaisana 4	0.89	-	9.6	9.7	9.6
	Firaisana 5	0.97	-	18.3	18.4	18.4
	Firaisana 6	0.62	-	8.0	8.4	8.2
	periphery	*reference cat.*		*20.1*	*20.2*	*20.1*
Years of education	*0-6 years*	*reference cat.*		*36.9*	*36.6*	*36.2*
	7-10 years	0.65	**	28.9	29.7	29.5
	11-22 years	0.92	-	34.2	33.7	34.4
Sex	male	1.51	*	49.3	48.7	49.0
	female	*reference cat.*		*50.7*	*51.3*	*51.0*

(1) *** significance level 1%; ** significance level 5%; * significance level 10%.

The section on the respondent's educational and occupational history

One question asked for the most precise possible description of the respondent's occupation. Many interviewers had difficulties with the occupational-status categories, some putting their respondents into an unduly high category while others underestimated their respondents' occupational status.

The response to the question on the reason for a change of job was often wrongly assigned, interviewers too frequently tending to opt for the category 'other reason'. Besides, whereas the question required the respondent to start from his or her present occupation and work back, which is why it was one of the last questions to be asked, the interviewers often produced a chronological list beginning with the reason for the respondent's first change of occupation.

As for the main location at which the respondent worked, we inadvertently omitted a specific category for farmers and farm workers. The selected category, which was the closest to agricultural activity, was 'premises used for professional purposes'.

The section on the respondent's marital history

In the questionnaire, the wording in Malagasy concerning the duration of periods of cohabitation was imprecise: *'Are you still cohabiting with this person?'*, whereas the intended sense of the question was *'Is this period of cohabitation still continuing?'* This created potential confusion in cases where a respondent had cohabited at several different times with a particular partner, leading to the recording of various periods of cohabitation with a partner as one unbroken period.

The section on the respondent's reproductive history

The section on the respondent's reproductive history does not seem to have posed any particular problems. As in other surveys of the same type, however, such as demographic and health surveys, it was difficult to ascertain whether any deceased children had been omitted from the survey by dint of the interviewer not having insisted on the need to take all children into account, including those who had died in infancy.

We might also have added to this section two or three questions concerning the educational and housing history of the respondent's offspring.

Some of the findings

Several types of analysis are possible on the basis of biographical surveys. The first published findings (Madio, 1999; Antoine, Bocquier, Razafindratsima and Roubaud, 2000) related to various specific domains: education, employment, marriage, fertility and housing. A simple method can be used to obtain a general picture of the development of people's life histories from one age group to another. For each of the age groups, we used a number of events which mark the transition to adulthood: leaving school, moving away from the parental

home, starting work (including vocational training), starting paid work, beginning the first live-in relationship, whatever form that might take, civil or religious marriage, the birth of a first child and moving into a home of one's own (in the case of women, this could be their own or their partner's home). The median age for each of these events can serve as an indicator of the age at which people in each of the three age groups took these various transitional steps. A comparison between the median ages for the three groups was made, focusing on the individuals who were present in Antananarivo at the age of 18.[6]

The differences between the age groups were far from identical for men and women. The men in all three groups seem to have experienced a similar sequence of events, albeit with different time gaps between them (see Diagram 2 below). The oldest age group (those born between 1943 and 1952), for example, finished their schooling in the sixties at 17.6 years of age, found their first work at 18.8 and their first paid employment at 20.3 years of age. These individuals began work before they began to form their own household. They left the parental home at 22.6 years of age, shortly before entering into their first live-in relationship at the age of 23.8 years. The birth of their first child and the formalisation of their union by means of a civil or religious marriage both occurred at 25.8 years of age. The last step in this transition process, obtaining a home of their own, was taken at 27.8 years of age.

The next age group, those born between 1953 and 1962, experienced the same sequence of events, with a considerably wider time gap between the start of their working life (their first paid employment was obtained at the age of 20.5 years, virtually the same as the average for the older age group) and the start of their family life: almost five years elapsed between the start of their working life and their departure from the parental home, which is two and a half years longer than the average gap for the group born in 1943-52. There was a similar length of delay in their becoming part of a couple and in the birth of their first child. The difference between the two groups was even more marked when it came to the age of marriage and setting up their own home, both of which occurred about 3.5 years later for the middle age group. These family events occurred in the 1980s, a period when conditions seem to have been more difficult for anyone trying to set up home. The youngest age group, i.e. those born between 1963 and 1972, had very similar life histories to those of the 1953-62 group, apart from the fact that all the events under consideration, except the end of formal education, occurred at a slightly earlier age among the younger group. The period between the completion of formal education and the start of working life was also shorter for the youngest age group than had been the case for the middle age group.

This sequence of events is radically different in the case of women (see Diagram 3 below), where numerous changes were observed between one age group and

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6 Those who moved to Antananarivo after the age of 18 were excluded from this analysis. The data from the Biomad98 survey, in fact, essentially relate to people who were born in the capital or spent their formative years there.

the next.[7] Between the women born in 1943-52 and those born in 1953-62, a few minor changes are worth emphasising: the start of working life came at an earlier age for the younger of the two groups than their departure from the parental home, and they obtained their first paid job at the same age as they began living as part of a couple, whereas the older age group had tended to obtain their first paid job when they were already part of a couple. In addition, the younger of the two groups tended to formalise their relationships by means of a civil or religious marriage a good bit later (1.6 years) than the older group had done.

But the more significant changes in social behaviour patterns among the women in the sample were recorded between the 1953-62 group and those born between 1963 and 1972. The young women born between 1963 and 1972, after completing their formal education one year later than the previous age group, started their working lives earlier and were in paid employment 1.3 years before the women of the middle age group. The youngest group began their working life before leaving the parental home, which they did at 21.3 years of age, 2.2 years later than the middle age group. They became part of a couple and bore their first child at a later age, but the interval between these two events diminished from 1.1 years to 0.8 of a year. Finally, the younger age group tended to obtain a home of their own and formalise their relationship at a considerably later stage. The women from the youngest age group in the sample had a gap of 3.6 years between the birth of their first child and the acquisition of their own home, while more than four years passed between the first birth and formal marriage. This means that the first years of the couple's life together would be spent in another person's home. Although a greater number of the youngest women had worked, and although they had found jobs more quickly, it still took them longer than the women of the two older groups to be established with their partner in a home of their own.

Conclusion

Although the link between the employment survey and the Biomad98 survey created technical difficulties, it turned out to be not only possible but efficient: the loss of individuals from the theoretical sample was fairly minimal – around 10% – and half of them were replaced from the reserve list. In this respect the Antananarivo survey produced better results than surveys of the same type conducted in other parts of Africa: in the Dakar survey, the loss of respondents had been 28.3%, essentially because of the delay of one month between the survey of the households providing the sample base and the biographical survey; in the Bamako survey, a 14.4% loss had been recorded (the survey took place the day after the survey of households, but no reserve list had been drawn up), while in Yaoundé 32.5% of the theoretical sample had been lost, in spite of

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[7] It should be borne in mind that there is no 'symmetry' between the men and women in the sample. The women in the sample are not the partners of the men in the sample, and some of them have married men from older age brackets than those examined in the Biomad98 survey. Similarly, men in the sample could be married to women who were below the age of 25 at the time of the survey.

the fact that the constraint of age-based stratification did not apply to that survey. The problems arising from the linkage between the employment and biographical surveys essentially related to the communication of information between the teams working on the two surveys, especially maps and information that would have enabled the Biomad teams to identify households and individuals more easily.

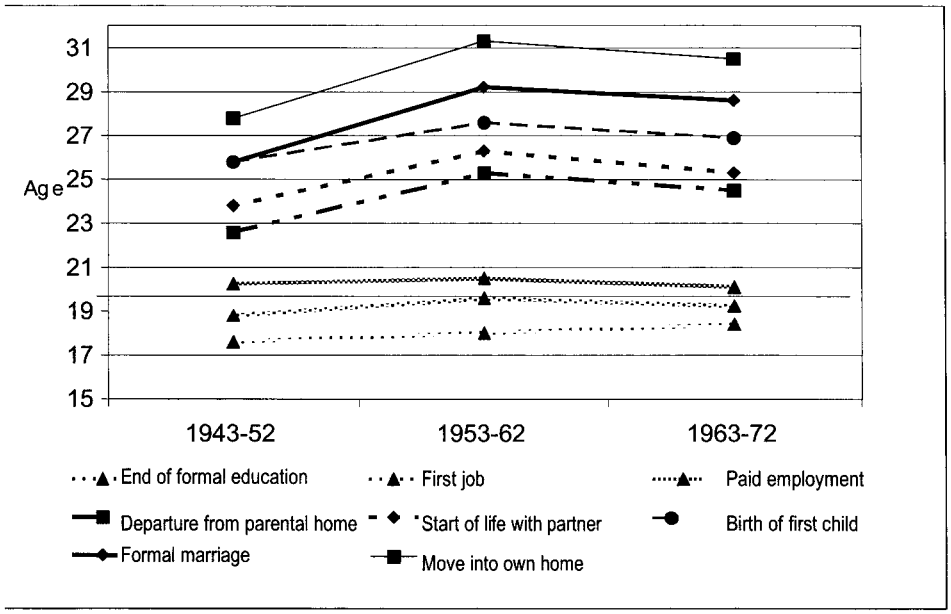
The difficulties encountered in the training of the interviewers and the administration of the biographical questionnaire were overcome, chiefly because of very close monitoring in the field and the direct involvement, at least in the initial stages, of the researchers who were responsible for the survey. It is important to emphasise that biographical surveys require very strict control in the field, particularly with regard to the dating and ordering of events. In this respect, the *Agévén* form once more proved to be a very efficient means of ensuring that the biographical data were well recorded and that individuals' life histories stretching back thirty to forty years from the date of the survey were accurately reconstituted.

As regards the content of the various sections of the questionnaire, the questions on housing and the development of the respondent's housing situation over the course of time certainly appeared to be the least satisfactory. It is hard to tell, however, whether this was due to a lack of improvement in the housing conditions of the inhabitants of Antananarivo, to the questions being badly formulated or to difficulties inherent in any treatment of the subject of housing. It is undoubtedly difficult to describe the features of a house in which one lived thirty or forty years ago, and these features could also have changed in the respondent's memory in the course of time. The team conducting the Biomad98 survey would certainly have benefited from the advice of a specialist in urban housing in Madagascar.

The questions on employment, by contrast, worked well in the field, apart from the question on reasons for changes of occupation, which is hardly surprising, since such a question tends to be more about opinion than fact, asking the respondent to rationalise past decisions; we knew from the outset that this type of question was ill-suited to a biographical questionnaire.

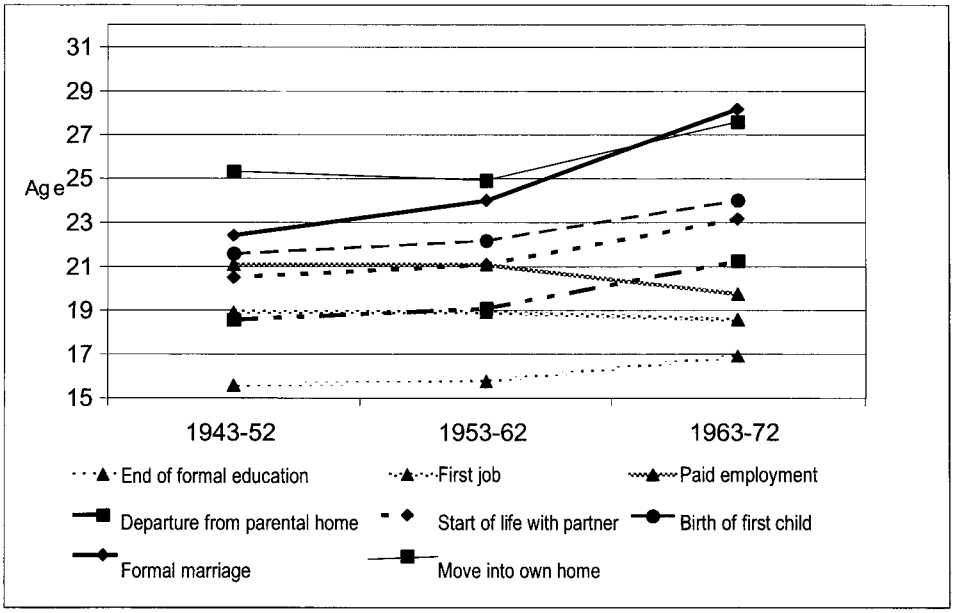
The section on the respondent's marital history in the Biomad98 survey was certainly the section with the largest number of innovative elements, and it was also the one in which the interviewers had to tread most warily. Nevertheless, the results were highly satisfactory. Once the interviewers were familiar with the sense and purpose of the questions, this section was properly completed; the data contained few inconsistencies and enabled us to retrace even the more complex marital histories of the respondents.

Diagram 2 Average age of men in the three age groups at the time of various events



Source: Biomad98 survey; Instat, Madio

Diagram 3 Average age of women in the three age groups at the time of various events



Source: Biomad98 survey; Instat, Madio.

The validation of data was a good test of the quality of data collection in the field. The Biomad98 survey turned out to be very successful in the sense that it required less correction than the other biographical surveys in terms of both the dating of events and the internal consistency of the various sections.

All in all, the biographical survey in Antananarivo provides a highly effective questionnaire and data-collection strategy, both of which can be put to good use in other contexts. The brunt of the effort to improve this methodology could focus on the questions concerning the respondents' housing history.

At the time of writing, Philippe Antoine and Philippe Bocquier were researchers at CEPED, while Thierry Maminirina and Nicolas Razafindratsima were working on the Madio project. Nicolas Razafindratsima was in charge of the Biomad98 survey.

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IN THIS ISSUE

by Philip Crook

As promised, this issue of Inter-Stat contains the final three articles related to the MADIO project in Madagascar.

In the first article, Philippe Antoine, Philippe Bocquier, Thierry Maminirina and Nicolas Razafindratsima describe a survey known as Biomad. Biomad was a retrospective survey of the dynamics of the urban job market and household living conditions over a 30 year period to 1998. It was one of a wave of surveys designed to renew the system for the collection of demographic data on geographical and social mobility, and follows on similar work in Bamako, Dakar and Yaoundé. The article well illustrates the benefits of such a survey and gives details of how it was undertaken.

The second article is by Mireille Razafindrakoto, who discusses how problematic it can be to monitor the formal activity of industries. This is often taken as a routine statistical activity, but Mireille argues that very few African countries have genuinely reliable data on the sector. The Malagasy experience of an annual survey of industry therefore illustrates the possibility of implementing a solid and reliable system for analysing changes in the formal industrial sector, and the benefits of doing so.

Our final article is by Isabelle Droy, Raphaël Ratovoarinony and François Roubaud, and concerns the setting up of four rural observatories across Madagascar. The word *observatoire*, I feel, does not translate easily into English, since the obvious equivalent, *observatory,* is so strongly linked with looking at the heavens that the sense in which it is meant now is obscured. That was of course the origin too in French – but in this context "the paramount aim of observatories is to identify, by means of a number of indicators, the dynamics of improvements or deteriorations that affect people and their living standards." In the case of Madagascar, that meant not merely viewing from afar a focal group of villages but also setting up a number of institutions which had a permanent staff for a fixed time period within the chosen survey areas.

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