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QUESTION DESIGN FOR MEASUREMENT OF SELECTED DEMOGRAPHIC EVENTS

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The best methods of measuring such central demographic concerns as age, parity and marriage have long been a source of interest, even of controversy. We review the evidence of WFS in this regard, based on the extensive experience of 42 developing country surveys.[1]

Our aim is to determine, as well as possible, what type of questions are most likely to yield reliable data on specific demographic events, for particular populations being surveyed. Apart from general design issues discussed in other assessment papers, fertility surveys involve special problems of demographic mesurement: the purpose of this paper is to document and critically review the different approaches taken by WFS surveys in measuring these particular events or subjects. Although careful and intensive training of interviewers, which was emphasized by WFS, is a necessary element in collecting high quality data, training cannot overcome bad question design or incorrect question content.

We face an important restriction: as the WFS mandate precluded major methodological fields experiments, the assessment of different techniques and questions will be based largely on subjective experience and judgement. Nevertheless, whenever possible, empirical evidence will also be used in evaluating questions. In addition we will draw heavily on evaluations of data quality, both comparative reviews (Chidambaram, Cleland and Verma, 1980 and Goldman, Rutstein and Singh, forthcoming) as well as reports on specific countries (see WFS Scientific Report series). Finally, on certain issues, more attention will be paid to a few countries which obtained and preserved more information of a kind that is relevant for this assessment. We will first discuss age reporting in the household survey, then dating of the respondent's birth, then birth histories, finally, questions on marital status and the dating of marriages.

1. OBTAINING AGE IN THE HOUSEHOLD SURVEY

WFS surveys consist of two interviews - the household interview is carried out first, to obtain some basic data on each household member, at the same time yielding the information necessary to select women who are eligible for the

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1. We will not be looking at the measurement of some factors (breastfeeding, amenorrhoea, coital frequency, infecundity and contraceptive use) which are discussed in other assessment papers.

individual interview. Basic data on household members such as age, education and marital status are needed to supply the base population for rates, although they are also useful in their own right. The usual recommendation is that the head of the household should be the informant, and in his absence, any adult member can supply the information.

We briefly consider age reporting in the household survey here, for two reasons: the quality of ... data in the household will indirectly affect any analyses that use the household population distribution as the base for rates; and seconaly, age obtained in the household can directly affect results in the individual survey, if this information is transferred for the individual respondent, or if the age recorded is biased to exclude some women from the eligible age-range. The first reason is sufficient justification for making a stronger effort to improve age reporting in the household survey. The second would be mitigated if reporting in the household survey was of a high quality, though other means would have to be used to deal with the problem of selectivity according to the minimum and maximum ages for eligibility.

Evaluations of data quality done for specific countries (see WFS Scientific Reports Series) show that age reporting in WFS household surveys was an improvement over other recent sources, censuses or surveys, in a fair number of cases making a substantial difference. Age distributions are smoother and indices of heaping lower for the WFS household surveys, especially in African and Middle Eastern countries. Moreover this improvement is in most countries greater for women's than for men's age-reporting. In addition, non-response was quite low - less than one per cent in all cases, and often only a fraction of one per cent. This is generally true whatever the mode of questionning used to obtain age. Given all the other intervening factors, we do not directly relate question format to data quality, but we nevertheless find that some forms of questions are better than others, and that the type of household survey (extended, often implying a larger sample, versus the short schedule) is related to differences in reporting quality.

QUESTION FORMAT

In their household schedule most (28) countries obtained age alone, not requiring date of birth in addition nor even allowing it as an option. Among these the wording of the question varied in precision:

- How old is he/she? 16 countries, mainly in Africa, Middle East and Asia.
- How old is he/she (in completed years)? eight countries, mainly in Latin America.
- How old was he/she at his/her last birthday? four countries, mainly in the Carribean.

Although instructions during training always stressed that it was age in completed years which had to be obtained, it has been the experience of WFS coordinators and country survey personnel, that interviewers tend to forget or misuse instructions specified in manuals and training, if the questionnaire itself does not carry a brief reminder. Thus the second question, with the reminder '(in completed years)' is to be preferred over the first question. The third question, although even more precise, will be limited to those countries where the birthday has some social and cultural recognition as an event to be celebrated, or where the date of birth is generally known.

Clearly even reminders on questionnaires will not have the desired effect in especially difficult interviewing situations. Despite this contrary indication, we recommend that whenever age is asked (in the Household schedule or in the individual survey to obtain respondent's, husband's or children's ages) the phrase 'completed years' should be added.

Although the date of birth would have been the preferred form of obtaining this information, it was not generally chosen, partly because the approach chosen for the household interview was a quasi-schedule, leaving the details of probing to the interviewer and partly because of the belief that date of birth takes longer than age to ascertain, and that proxy-reporting of date of birth is not so easy. Some countries (Benin, Cameroon, Ghana, Kenya, Nigeria, Senegal, Bangladesh, Sri Lanka, Korea, Malaysia, Philippines, Thailand) did obtain the date of birth, in all cases except Cameroon, Senegal and Bangladesh, also obtaining age, either for all persons or for those whose date of birth was not known (see Table 1). In most of these countries dates were obtained for the majority of household members. Where both items were asked, the usual approach was to instruct the interviewer to resolve any inconsistency in the field, and correct the data in the same space provided. This approach was unfortunate, since it not only increased the work of the interviewer but it also destroyed some possibly useful information which would have allowed comparison and evaluation of the reliability of the two types of sources. It is quite likely that in an unknown proportion of cases, age was

in fact given and converted to a calendar year, particularly where both items were asked for all members, since the interviewer would be likely to think that both were expected to be filled in[2]. These problems could have been avoided as shown in the recommendations.

Because of the importance of obtaining good quality household data on age, which has become evident from its impact on analysis of individual data, we recommend that the schedule approach be replaced with a somewhat more detailed specification of questions, roughly similar to what has been done for the respondent's date of birth in the individual questionnaire . The interviewer should first obtain any available official documents, and use those which are known to be acceptable to obtain the date of birth. This approach is especially recommended where reliable birth registration is substantial (eg over 25 per cent) but would be helpful even if the per cent is lower (Ewbank, 1981 reached the same recommendation). Results from documents can be recorded in the same space as the results of a subsequent direct question on date of birth, if use or non-use of a document is also recorded. Where a document is available, age should also be asked, any discrepancies between the two should be reconciled and the interviewers estimate recorded separately. Where no document is available, a direct question on the date of birth should then be asked; again, if no calendar year can be given, age should be obtained, in completed years. If some countries wish, for experimental or other purposes, to obtain both date and age for each member, then the reconciled final estimate of the interviewer should be
entered in a separate column, which could be the same as for the reconciled document and age estimate. The layout, without yet specifying questions, would roughly be as follows:

Document obtained (1)=Yes (2)=No	Calendar Date _____ _____ Year Month	Age in Completed years	Interviewer's Estimate of age

2 Senegal was a special case where only the year of birth was recorded. That this was largely obtained by converting age to a calendar year, can be inferred from the fact that only 27% supplied a month.

The approach would clearly take some more space and time than the current approach. However, we think that the crucial importance of obtaining the best possible estimate of age, as well as the fact that the results from WFS surveys using the 'schedule' approach contained many defects, justifies putting some more effort into obtaining better data on age. This detailed approach is most justified for females in the age-range 10-55, because both for eligibility and for use as a base population, it is this group that is crucial. If there is any likelihood of transferring the ages of children to the individual interview, this approach would also be preferred for children.

Three African countries have used a completely different approach from the usual one. Ghana and Kenya used detailed probes in the household interview to obtain the date of birth or age of women over the age of 10, and then transferred this best estimate to the individual interview[3]. This was done on the principle that the time consuming process of obtaining a good estimate should not be repeated twice. Senegal went further, and not only developed a specific procedure for obtaining the year of birth of all women[4], but also used the age-event chart in the household interview, for all women, obtaining dates of births and marriages, specifically as a means of improving dating of the woman's birth. The quality of household data in Senegal was very good, compared to other Sub-Saharan African surveys (Goldman, Rutstein and Singh, forthcoming) suggesting that the extra effort spent was worthwhile. The results for Kenya were not as positive, however, since comparison of age data

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3 Date of birth was asked first, and age was also obtained for everyone, with inconsistencies of over one year being probed and resolved. If date and age were not known, documents were then requested, and if those were unavailable, a historical calendar was used to help estimate age. This list was used in conjunction with other events such as age and number of children or age at marriage, to reach an estimate. Other household members could also be consulted and in the last resort, personal appearance was used to make an estimate.

4 The date of birth was asked, and confirmed with documents (for those born after 1960, if they were not residents of the four large cities, and for all persons resident in these cities). Where documents were not acceptable, reported year or age was crosschecked with probes from a historical calendar, or for women over age 12, by use of an event chart.

of the WFS household survey and that of the larger survey (NDS), which formed the frame for the WFS sample, showed about the same degree of heaping on ages 0 and 5, even though the NDS used no special efforts in probing, and their interviewers were trained for a shorter time duration. Transfer of women out of the eligible age range, at the margin (15-19 and 45-50) was also substantial (Goldman, Rutstein and Singh, forthcoming). Ghana, where a similar approach of intensive probing in the household interview was used, had somewhat better reporting than the census, but it was no better for women, who were the ones probed, than for men. Pushing of 45-49 year-olds into the 50-54 age-group, by interviewers, to minimize their work load, also occurred.

While these approaches may not be suitable for all countries, the principle that accurate measurement of age requires greater care than a single question, is a generally applicable one. The use of an event chart[5] in the household is, however, questionable, and especially so in the case of Senegal, where this was even done for an extended sample. Although Senegal found it a useful approach (especially since the WFS survey was part of a multiround survey) and in fact the quality of data obtained was very good, we would not recommend this time-consuming approach for general use.

BIASES IN SELECTING ELIGIBLE WOMEN

A different, but equally important problem is that of interviewers deliberately or semi-consciously pushing females at the marginal ages (15-19, 45-49 into younger and older age-groups, respectively, to prevent them from falling into the age-range to be eligible for the individual interview. This problem was observed in both extended and non-extended household samples but was less serious at the lower end of the age-range in the extended surveys (Scott and Harpham, forthcoming). One of the major implications of these biases, in particular for measurement of fertility, is the strong restriction on the use of the data for the 45-49 age-group, observed in most WFS surveys (Goldman, Rutstein and Singh, forthcoming).

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5 See Section 3 for explanation of what is an event chart.

One solution is to expand the eligible age, at least at the upper end, to 54, omitting the 50-54 group analysis: age-transfer will probably still occur, but in this case it will be from the 50-54 into the 55-59 age-group, leaving the 45-49 age group relatively unaffected. The Cameroon experience, where 54 was the upper age limit, also supports this suggestion. It is difficult to suggest any solution for transference from the 15-19 to the 10-14 age group, other than improving procedures for obtaining date of birth/age in the household survey. One possibly useful approach, for ever-married samples, is to have no lower age limit, simply including all ever-married females up to some maximum age.

EXTENDED AND NON-EXTENDED HOUSEHOLD SURVEYS

Checking of the consistency between date/age data from the household and from the individual surveys showed some interesting and suggestive differences between these two types of surveys (See table 1). The very high level of consistency even at single years of age (97-98%), where there was no sub-selection of women, suggests that transference of information from the household to the individual interview (or vice versa) is common. In contrast, in the three cases of extended samples, even though the same interviewers were used, consistency in single years of age was only moderate (61-67%), and consistency in five-year age-group was, as expected higher, 88-89%. Two other extended sample surveys (Indonesia and Turkey) had moderately high consistency (about 80 per cent) in single years, but were still much lower than the non-extended surveys.

The case of Tunisia lends support to the recommendation for separate recording of date, age and the reconciled estimate, because the relatively low consistency for the single year comparison of household and individual reports on age show that contamination of individual interview data by household data was very low, even though the two operations were not independent. These results support the earlier argument that it may be better to record age and date separately and not to correct either, but to have the final reconciled estimate in a third location.

COVERAGE OF SINGLE WOMEN

This issue involves the joint use of household and individual data. Where the individual survey contains only ever-married women, household data on single woman must be used to provide an all-woman base population, which is needed for several aspects of analysis. This has been a source of many problems in WFS experience: the reporting of age and marital status in the household survey is usually of lower quality than that in the individual survey, partly because of proxy reporting but also because of eligibility bias, and this may affect the household survey's proportions single which are used in conjunction with the individual survey's age distribution. Perhaps a more serious problem is the limitation placed on any analysis needing an all-woman base, in terms of socio-economic characteristics: subgroup analysis can only be done for those characteristics obtained in the Household Survey. For both of these reasons, it would seem that the best approach is to include single women in the individual survey, using either a special short questionnaire or taking them through the section on background characteristics and the work history, at least.

2. OBTAINING RESPONDENT'S AGE IN THE INDIVIDUAL INTERVIEW

In general, more effort was devoted to obtaining the respondent's date of birth than in the household survey: usually the date of birth was first asked, and if this was not known, the age was then obtained or estimated. A fair proportion of countries obtained both items for each woman, and in a few cases, age was asked in a totally separate location from date of birth, in an attempt to obtain an independent estimate. This is probably a useful practice, since interviewers are much less likely to remember or to go back to the household schedule, when they are in a later section of the individual questionnaire. The experience of Tunisia, where age was obtained late in the interview, and where consistency between age in the individual and household interview was moderately low, supports the argument. Again, as for age in the household interview, documents were asked for only in a few countries, and even in these cases, use of documents was not always recorded.

The failure to incorporate use of documents into the core-questionnaire itself (e.g. birth certificates, or identity cards) is also striking. This is a reliable source in many countries, and will increasingly become so, although, given each country's circumstances, special restrictions can be made

if necessary, eg in Senegal, certificates after a certain year were known to be accurate, and therefore only these were accepted. An advisable precaution in using this source would be to also ask age, and to probe and reconcile the two sources if they differed by more than some minimum amount. One advantage in using and separately recording this source, is to obtain some measure of the functioning of vital registration systems. This can be a very useful input into the country's data collection system.

Results on the quality of age-reporting in the individual surveys show the usual problems of heaping on preferred digits, as well as some transference between age-groups, although the problem is generally much less severe than in the household data. We would recommend that a similar approach to that suggested for the household survey be used in the individual interview, that is obtaining documents if available, and age, reconciling the two; or obtaining date of birth if no document was available, and finally probing and estimating age if neither a document nor the year of birth could be obtained. It would be reasonable to transfer information from the household to the individual interview, only if detailed questions were used, and if the eligible female was herself the respondent on the household interview. Where the two interviews occur on the same day, and these other conditions are met, it would in fact be most logical to transfer the information, rather than repeating the same question to the same woman. If this approach is used, the identity of the household respondent should be recorded.

The merits and demerits of recording the date of any one given event in two or more modes are of some interest. The reason for doing this may be purely as an experiment, to gain some idea of the relative quality and preference for reporting dates in different modes. In most cases where this was done, however, at least part, if not the whole, justification was to somehow crosscheck modes against each other, to produce a better estimate. WFS experience suggests that the use for crosschecking did not work very well in practice. Where editing is concerned, a priority would have to be established, in any case, eg using date of birth wherever available, and only using age where the year was missing, since it is difficult to think of any meaningful automatic rules for reconciling two or more estimates that differ substantialy. It is almost as problematic for such a process to be carried out in manual editing. The most reasonable approach would seem to be the resolution of any differences by the interviewer in the field, with the respondent: it is the interviewer who will be best able to judge, from the

manner in which different estimates are given, and from all the other information at hand, which is the best estimate of the date of the event. Most countries which used multiple modes restricted themselves to two, eg date and age for the respondent's birth, date, and years ago (=age of the child) for children's births, and date and duration for marriages. A few countries did resolve differences in the field, but usually did not record the interviewer's estimate in a separate location. When no resolution was achieved, we expect that priority was given to date, and no attempt was made to reconcile the two estimates.

Cameroon was a notable exception, using several modes - in the case of respondent's birth, the calendar date, a document, and age were asked in different locations, and no attempt was made by the interviewer to reconcile these estimates. In the case of dates of pregnancies, four modes were used, one basic one, the date, and if this was not known, three other modes were obtained in all cases, how long ago, the mother's age at the time and the duration of the interval between pregnancies. This multiple recording of modes without resolution in the field created severe problems for the imputation of dates, because of substantial discrepancies between the different estimates.

3. BIRTH AND PREGNANCY HISTORIES

One of the most important aspects of WFS surveys was the collection of dates of all live-births, sex, survival status and date or age at death. The richness of the analysis possible and the information yielded from use of a full birth history, on levels and trends in both fertility and mortality, conclusively confirms that the decision was a good one. While the overall approach is to be recommended, some details of the core questionnaire's approach can, however, be improved. This section draws upon an earlier paper on data collection techniques and problems (Scott and Singh 1980).

Evaluations of the quality of birth history data find some of the usual problems associated with retrospective surveys eg displacement of births, typically resulting in heaping at the period 5-14 years before the survey, and some omission of births, especially for the oldest age-group. The collection of retrospective data is itself likely to cause problems, where dates of births are not used in day-to-day circumstances. It is nevertheless still

necessary and useful, to examine the techniques of data collection which were used by WFS surveys, with the aim of identifying those which worked well and those which failed (See Goldman et al, forthcoming, Chidambaram et al, 1980, and evaluation reports on individual countries).

The usual format is to precede the birth history by a set of five questions on number of sons and daughters living with the respondent and living away from home and the number of children who have died, in order to obtain the total number of children ever born. However the possible problem of adopted children was ignored. Any discrepancy between the numbers thus given and those listed in the birth history is reconciled by further probing. This set of questions has generally been found useful, as an introduction to asking detailed question on each birth, and for this reason it should be retained. Some modifications which were tried out were to shorten the series (eg referring only to children, not boys and girls separately) and secondly, for all-woman samples, to separate out never-pregnant women first. From existing data it would appear that the birth history added only a few extra births to that obtained by these questions. However the possibility that interviewers corrected these numbers after the birth history, still exists, and the extent of this is unknown.

The more crucial part of this section of the questionnaire is the birth history itself. The originally recommended approach was to use two separate tables, the first for all live-births, and the second for all other pregnancies that did not result in a live-birth. In practice this approach was used by only a minority of countries, while the majority preferred differently structured histories. We will discuss these different types of maternity histories first, and then consider the problems of obtaining dates of live-births.

STRUCTURE OF THE MATERNITY HISTORY

Variations from the recommended format of two separate tables were developed in an attempt to improve reporting of both live and non-live births. Use of one table, on which all pregnancy terminations would be entered, was a common element in all the variations. The intention was to improve dating of live-births by probing for non-live births, dating these events within an interval, at least, even if an exact date of termination was unavailable. At the same time a unified sequence would make long gaps more easily apparent,

and these could then be probed for omitted events. Finally, transference from non-live-birth status into the sequence of live-births (as a result of the special probe on signs of life) would be easier on an integrated history table than with two separate tables.

The most common variation on the core format was to integrate the recording of other pregnancies with that of live-births, probing each birth interval for other pregnancies and entering all data in a single table. This integration was done by different means however. The most common method was first to collect data on all live-births and then probe each interval for non-live pregnancies. Another alternative was to ask about all living children, then all dead children, then all still-births and finally all miscarriages and abortions, with a back-up probe for all intervals of some minimum length, the minimum varying between countries. A third method was to use a pregnancy history rather than a birth history, asking about the first to the last pregnancy in sequence, at the same time determining the outcome of each. A fourth approach was to obtain live-births, but to probe each birth interval for other pregnancies as soon as that interval was identified.

It is difficult to evaluate the relative success of the different approaches from the data available. While coverage of foetal losses may be considered one possible measure of success, this measure would be influenced by factors other than the technique of questioning, not least of them being the true variation in the level of 'other pregnancies', which includes induced abortions. Coverage of 'other pregnancies', measured as the rate per 1000 fertile pregnancies does show that most surveys obtained a rate of 60 per 1000, or higher (Ashurst and Casterline, forthcoming). The biological minimum for spontaneous abortions and still births beyond the 2nd month of pregnancy is 12 per cent but half of this occurs in the third month alone (Bongaarts and Potter 1983). Losses in the first 8 weeks and some losses in the third month may not be observed and therefore not reported, suggesting that coverage in the surveys was reasonably adequate.

Some general statements based on WFS experience can be made, however. The opinion of staff who have used both the separated and the integrated approaches is that the integrated is better since it usually provides more accurate placement of 'other pregnancies'. This in itself would improve the dating and coverage of dates of live-births. Secondly, most countries which used an integrated structure preferred obtaining a history of live-births and then adding in 'other pregnancies' for each interval, rather than asking for a

chronological history of all pregnancies. This was justified either on cultural ground or because it was believed that a woman would naturally think in terms of her live-births rather than in terms of her pregnancies. In addition the chronological pregnancy history, as compared with the interval method, loses the advantage of better recording of live-birth dates (except for imputation).

The use of a 'segmented' history by a few Latin American countries and the Philippines (all living children, then all dead children, then all miscarriages (split into two groups, sometimes) may be queried, since it makes the interviewer's checking of the consistency of dates of all live-births and other pregnancies somewhat difficult, and it partly loses the advantage of a chronological sequence which may assist the respondent in dating events.

These variations in structure arose chiefly because of the aim of collecting the best possible data on live births. The original reason for including questions on non-livebirths had been simply as a means of finding omitted live-births which died soon after birth, and which were therefore supposed to have a high probability of being forgotten. The question, 'did the baby cry or show any other sign of life after it was born?' was asked in regard to all still-births, in order to cover live-births which might otherwise be missed. If this is considered to be the sole or the primary reason for asking about non-live-births, then the results suggest that there was no need for these probes. Several countries did not use the question at all, but among those which did the number of live-births discovered was in all cases less than 0.1 per cent of the total number of pregnancies. These results have two alternative interpretations: either the question was unsuccessful in obtaining positive answers even where children had shown signs of life, or the history tables were successful in obtaining most live-births in the first place. In either case, the question as it stands has not added a significant amount of information, and would seem unnecessary.

However, the advantage of non-live births is improving the dating and the recording of live-births, both during the interview and later, in the process of machine imputation, cannot be ignored. Thus this may still be a useful approach, in countries where obtaining dates is especially difficult, and where in the absence of probes about non-live-births, the tendency to report the same interval duration may be even stronger than what is already believed

to exist. The feasibility of including questions on induced abortions would have to be decided on a country-specific basis. A second reason for collecting this information, which applies only to a sub-set of countries, is its substantive importance when induced abortion is known or believed to be significant.

The possibility of improving dating in the field definitely exists, both in the case where probing occurs after all live births are dated, and where probing occurs after each birth is entered, as long as interviewers are trained to use the duration of non-live births as a check on dates of live births, and to probe and change the latter when necessary. If non-live pregnancies are to be used solely as an aid for dating live-births, it seems logical that only durations, not the actual dates, of these events would be needed.

The alternatives of proceeding chronologically in the history, beginning with the first event, or going backwards, beginning with the most recent event, were also considered carefully. Almost all countries chose the chronological order, again because it was believed to be closer to the woman's mental framework. Haiti and Senegal used the reverse app oach, partly because of the advantage this method was expected to have in producing better dating of the most recent two births, a result that would be especially useful for estimating current fertility.

These two countries do not allow any evaluation of the merits of the backward approach; however a few suggestive results were found by other studies. The Bangladesh tape-recording study found that interviewer performance declined as the birth history proceeds: there was an increasing tendency to accept approximate answers in the form of child's age or number of year since birth, in the face of the respondent's inability to give quick answers (Thompson et al, 1982). Balancing this finding, we see that the last birth is usually recalled with greater accuracy, bacause of the recency of the event (Chidambaram and Sathar, forthcoming). An experimental study in Bangladesh, using each approach, forward and backward on half of the sample, found slight advantages for the backward approach (Becker and Mahmud 1984) - the proportion of events correctly placed in time was the same for both approaches, and although the forward approach had slightly more missed live births, misred births were rare, and this was therefore not so important.

However the backward form had the advantage of a more symetric distribution of misreporting errors, which was reflected in more accurate fertility rates for the period 10-14 years before survey. Finaly, another small experimental study on university students in the United States on the names of teachers from Grades 1-12, found that backward-oriented search was more successful and efficient, and that the probability of recalling an item from autobiographical memory is primarily a function of recency (Whitten and Leonard, 1981).

Our recommendation is to use only a live-birth history, without any questions on non-live-births, in countries where dates are relatively easy to obtain, and accurate, but where, in addition, induced abortion is unimportant. However when either or both of these two conditions are not met, serious consideration should be given to inclusion of questions on non-live births, not as a means of finding missed live-births, but either to help with dating live-births, and/or to obtain a measure of the incidence of induced abortion. Where the decision is to cover non-live births, use of some form of integrated history would be preferable to use of two separate tables.

TECHNIQUES FOR OBTAINING DATES IN THE BIRTH HISTORY

The question used to obtain the dates of event in the history table varied among countries. The recommended core questions were 'in what month and year did.....occur? and if the year was unknown, then 'how many years ago .....? To obtain the age at death of children who died, the core question was 'for how long did the child live'? For both events most countries used the core questions, but some countries also added other probes, while aids to dating, such as event charts, were used in some cases.

In attempting to evaluate the success of the different questioning techniques we encounter the same problems as with date of birth of the respondent. It is not the questions alone that are at issue, but the importance of dates in the society, which influences the level of knowledge of dates. However, on the basis of the varied experience of the WFS countries, we make some suggestions about the techniques which were tried out.

In obtaining dates of live-births, we would suggest, even more so than for other events, that documents (ie typically the birth certificate) be consulted, and backed up with the recording of age, with any discrepancy being resolved by the interviewer in a separate location. If birth certificates are

known to be reliable, the recording of age may be limited to cases where no certificate is available, both in the instance when date of birth is given, and necessarily so if date is not known. While use of a third location will not prevent contamination by interviewers (eg interviewer calculating age instead of asking it) it will certainly limit the amount of manipulation of the data that the interviewer can achieve. It is striking that so few countries considered this a worthwhile approach. Presumably, with increasing modernization, registration of births will become increasingly common and reliable. We recognize that registration is of doubtful quality in many countries, but still think that with appropriate rules (eg as in Senegal, after a certain year, birth certificates are reliable in the whole country, but within certain urban centres, they are reliable even before that year) this can be an extremely useful tool. Separate recording of the use of documents is also to be recommended, partly to allow analysis of data quality, and partly as an objective check on the vital registration system.

Date of birth with years ago or age as a probe, would be the alternative if no document were available. Intervals between events should be the last resort, since there is a well-known tendency to give uniform intervals, 2, 2.5 or 3 years, rather than exact interval durations. However whenever age is used the need to specify completed years is especially important because of the common tendency to confuse completed (5.1-5.9 = 5) with rounded years (4.5-5.5 = 5) and projected years (4.1-5.0 = 5). The article by Chidambaram and Pullum (1981) shows that in the extreme case, where a high proportion of birthdates were imputed, and an increasing proportion going back in time, incorrect interpretation of reported rounded years as complete years for dating of children's births in the individual interview could affect the measurement of fertility by displacing births six months closer to the interview. In the same country, Bangladesh, a study of tape-recordings of interviews shows that interviewers did not try to obtain completed years, even though this was specified in training and on the questionnaire itself (Thompson et al, 1982).

In obtaining and recording the age at death, care should be taken to record the exact age, in months and years, and <u>not</u> to lose this detail by recording the information in groups eg less than one year, 1-2 years, and so on. A further minor point is that experience suggests that it is better to obtain the name of a child first, then ask questions, because this makes it clear which child is being asked about, rather than, as in the original core

questionnaire, referring to 'your first birth', 'your second birth' and so on, until it was ascertained that the child was still alive. The care taken to avoid upsetting the respondent by obtaining names of children who died seems to be excessive and unnecessary, in most cultures.

In some countries where dating was known to be problematic, additional techniques were used, such as the Age-event chart, the historical calendar, and conversion charts along the lines of the Takeshita method. The conversion chart is used for the birth history and consists of two or possibly 3 columns expresing years in alternative forms - calendar year, years ago and possibly also a Non-Western calendar year equal to the Western year. The conversion chart does have the advantage shared by the age-event chart of calibrating all births in one form of recording and thereby allowing quick checking of consistency. The ordinary birth history allows events to be recorded in either calendar or "years ago" format, making subsequent checking very difficult. The other two types of aids were used not only for dating births of children, but for all other events as well. However the main aim of the Age-event chart and other conversion charts was to assist with dating births, pregnancies and marriages. WFS experience with historial calendars, or lists of events and their corresponding years, has not been good. It is difficult to find any group of events which are commonly known, even if the lists are varied among regions; in developing countries, awareness of the dates of political or national events, even important ones, tends to be low. Another disadvantage is that when interviewers probe, using specific events and dates, this in itself will probably bias the respondent towards reporting these dates (see also Ewbanks 1981; Scott and Sabagh 1970). In contrast, experience with the age-event chart has generally been very good: as a visual summary of the vital events in the woman's life it facilitates the checking of consistency of dates of events, and in probing where inconsistencies or large unexpected gaps occur. Various designs have been used, and in general any of the continuous charts seem to work equally well. The technique is sufficiently uncommon to require some explanation. The chart generally takes the form of a horseshoe-shaped curve, or occasionally a circle, with calendar years and the equivalent number of years ago printed along the curve. Historical events may also be indicated next to the appropriate year as a further aid in probing. Events in the woman's life, starting with her date of birth, then the dates of her children's births, and the dates of her marriages are all entered on this chart (see Figure 1). The interviewer then has an easy visual image of the events and can quickly evaluate their consistency.

Further, implausibly long or short intervals between events become clearly visible and can then be probed. Finally, the systematic presentation of information in the chart helps to sort out confusions arising from what is often a chaotic set of responses - for example mixing dates, intervals and years ago. One design that gave some problems was that used in Nigeria, where a rectangular shape rather than a smooth curve was used, and where a break occurred in the chart, and the result was very confusing (see Figure 1). Nigeria did have a useful innovation as well, however - the interviewer was instructed to enter, on the event-chart, the points at which the respondent was aged 5, 10, 15, 20 etc., thereby providing not just the usual two types of format, but also a third, respondent's age.

The event chart does have disadvantages, however: the fact that information must be copied from the chart to the questionnaire, while still in the field, not only takes time but also introduces a source of error. In comparison, the conversion chart does not have this problem. This can be quite a serious error, if for example, the order of recent births is incorectly entered, since many other questions use the last closed and open intervals, referring to names of children to identify these intervals. One possible solution to minimize errors in transference is to have the event chart fold out so that it is completely visible. Another disadvantage is that neither the age-event nor the conversion chart allows recording of the format in which dates are supplied. This information is of methodological interest and could be retained by adding an extra column to the maternity history, specifying the format of dating. The many advantages of age-event charts outweigh this minor possible disadvantage, however.

Conversion charts, specifically designed for the birth history, were used in Nepal, Malaysia and Korea. The simplest form of this chart is to have two adjacent columns, one with calendar years and the other with the equivalent number of years ago for the last 50 years. Nepal and Korea added a third column, the Nepalese calendar year and the Chinese animal year, respectively, while Korea alone added a fourth column, the age of the respondent at the time of the birth, entered by the interviewer for each respondent. The advantage of this type of chart is easy conversion from any mode to the coded mode, the western calendar year. A further advantage of this arrangement is to make the length of intervals obvious at a glance to the interviewer, thereby facilitating the probing of intervals for missed pregnancies or abortions. In this respect the method can be seen as a variation of the event chart. The

disadvantage, relative to an age-event chart, is that births are not seen in the perspective of other events (eg marriages), to allow consistency with these to be checked.

The conversion chart is useful where more than one calendar system is in use (eg Chinese or Nepalese calendars). It was particularly suitable in Korea, given a situation where accurate dating was common, but with a high prevalence of non-live pregnancies, some of which would be missed if the interviewer were not aware of the length of intervals. Malaysia also used this approach and found it useful, although there were minor problems with the layout of the table. In Nepal, this technique was probably not the best choice, given the relatively low accuracy of reported dates of live-births.

From this discussion of the advantages and disadvantages of the different aids for dating events, we can see that the usefulness of each type depends on the particular situation of each country. When reporting of dates is generally bad, and where unconventional union systems are found, an age-event chart is highly recommended. It will improve the dating of both marriages and pregnancies. Where it is believed knowledge of dates is good, but dates are likely to be reported in different types of calendars (eg Chinese and Western) or in different forms (years ago and calendar year) but where marriage is the main form of union then a conversion chart would be more useful.

4. MARITAL STATUS AND DATING OF MARRIAGE

WFS surveys aimed to obtain marital or union status at the time of the interview, and to record the dates of starting and ending all socially recognized unions. The generally accepted definitions or names of unions current in each society were used by these surveys. Thus, in effect, socially recognized unions were recorded, but with individual women interpreting the questions and expressions, some variations in what was considered to be a particular type of union must have been introduced. In many countries, especially in Asia, North Africa and the Middle East, this issue does not arise, because legal marriage is essentially the sole type of union. However it is of crucial importance in Latin America, the Caribbean and sub-Saharan Africa, where informal and consensual unions are common. These non-legalized unions are important because not only do a substantial proportion of the population enter them for lengtly durations, but childbearing within these

unions is frequently as high and occasionally higher than that within marriage. Thus, if exposure to the risk of pregnancy is to be accurately estimated, time spent in both formal and informal unions must be obtained.

In the case of the Caribbean and Latin America, a fair amount or research has been carried out on union patterns and the basic union types are believed to be commonly recognized. Nevertheless, we evaluate the coverage of unions achieved by the union histories of these WFS surveys eg by looking at out-of-union fertility, because of the posibility of problems of memory lapse in retrospective surveys and of misunderstanding by respondents of what the questions mean, and to estimate the amount of exposure that does not fall within socially recognized unions. It may be that analysts will decide that although complete measurement of exposure is the ideal, it is unrealistic in societies where casual relationships are frequent. Alternatively, analysts may prefer to have exposure recorded as accurately as possible, with the option of deciding on some objective criterion (eg a minimum duration) for what will be considered true unions. WFS surveys have not used the latter approach, but it may be feasible, at least for a recent period eg the last five years. In the case of sub-Saharan Africa, some evaluation of the success in coverage of unions is even more necessary, bacause less is known about union systems in the region. The fairly high level of pre-marital fertility observed in this region (Goldman, Rutstein and Singh, forthcoming) strongly suggests that the anthropological literature should be reviewed, and more pre-testing done, if questionnaires are to reflect the actual union system. Other than modifications for polygamy, WFS questionnaires for this region have typically asked only about marriages, with only a few important exceptions

Perhaps the two most problematic aspects were dating of the first union/marriage and dating of the beginning and end of earlier marriages. We focus on the problem of accurate dating here, but in addition, we consider probes on marital status and the special topic of polygamy.

DATING THE FIRST MARRIAGE OR UNION

The definition of union or marriage itself influenced the date obtained. The aim of WFS surveys was to obtain the date of first sexual exposure within a union. Where legal/customary marriage was the primary type of union, the difficulty was to ensure that the date of consummation, and not the date of the formal ceremony, was obtained. Where consensual or common-law or visiting

unions were common, the date of the earliest union was the desired measure, and it was important to probe even currently married women about the date when their sexual relationship began, rather than obtaining the date of their legal marriage. In those societies where informal unions were common, the age at first sexual intercourse would have been an additional useful point in measuring the beginning of exposure, because casual relationships which may not be considered to be a union, or which may be with a partner other than the partner of the first union, would be otherwise omitted.

Although countries had in common the intention of obtaining at least the date of first exposure within a union, very different approaches were used to achieve this aim. In the case of societies where legal/customary marriage was essentially the only form of union, and where a formal ceremony might precede or postdate the beginning of cohabitation, the best approach for avoiding confusion is to obtain either both dates, or one date and the duration of the gap before or after it. Only Bangladesh, Tunisia and the Philippines took this approach, and the results showed that it was very useful - 21 per cent of women in Bangladesh started living together only after an appreciable period following marriage, with an average delay of 22 months; in the Philippines 15.5 per cent of couples started living together before marriage, and their average period of living together before was 8.5 months, while another 1 per cent began to live together after marriage, with an average delay of 6 months. In the case of Tunisia 35.8 per cent of couples have had no delay between formal ceremony and cohabitation while 57.3 per cent started living together, on average 15 months after the ceremony, and 6.9 per cent legalised their union after starting living together. More typically, only one date was obtained, the intention being to obtain the date of cohabitation. Other countries where the problem could arise, in Asia, the Middle East and North Africa, asked for the date of the consumation ceremony, or used a term which translates as 'living together', rather than the marriage ceremony itself. While this is a reasonable approach, it is still true that this approach is less certain to avoid confusion, than if both dates were obtained.

In countries where legal/customary marriage was not the only type of union, where other types of unions are equally recognized and could be of equally long duration, probing for the date of the first union should take a different form. Not only should women in married unions be probed about the existence of an informal union with their current partner, preceding their marriage, but probes should also be included about informal unions with partners other than

the partner in the union reported as the first. Finally, the date of first sexual intercourse would be a helpful additional piece of information.

Probing for the date of the first union/relationship may best be done in the form of a set of questions coming after current status is established, but separate from the union history. This was done in Ivory Coast as follows:

1) Current status established.
2) How many times married.
3) If more than once, questions then phrased in terms of 'your first union' rather than 'your union'.
4) If marriage, date of marriage obtained (special probing for customary marriages, which may involve a delay in the start of cohabitation).
5) Probing civil marriages and customary marriages where cohabitation began at the date of the marriage about whether lived together before marriage.
6 Probing everyone, including those in a 'union libre' about whether had sexual relations with their (first) husband before living together.

This detailed probing showed that about one quarter of women had customary marriages with a later date of consumation, about 10 per cent of ever-in-union women started living together before the date of marriage, and about one quarter of all ever-in-union women had sexual relations with their partner before starting to live together.

One additional factor that should have been included in Ivory Coast is some probing for unions with partners other than the one with whom the first union was formed. The existence of some pre-union births, even after the date of first sexual relations with the first partner was established, supports this suggestion. It should be recognized, however, that in a sexually free society, even if all unions/partnerships are recorded, some out-of-union births will be unavoidable.

Typically, most countries in Africa and Latin America used a much less thorough approach in probing for the date of first exposure. In both regions, the phrase 'begin to live together' was used in dating both the current union, and earlier unions in the union history, and in Latin America consensual unions were recognized in coding type of union. However most countries used no additional probes on living together before marriage or casual relationships before the first union or marriage. A few partial exceptions

exist (eg Benin and Cameroon obtained the date of first intercourse separately, Nigeria asked interviewers to probe to make sure that the date given as the start of unions/marriages was the date when sexual relations began, and Mexico probed women in married unions about whether they started living together before the date of marriage, and recorded both dates). Four Caribbean countries used a very different approach from that of the core, to allow for a wide definition of unions, including one or more types of non-cohabiting unions. Although these countries probed thoroughly for current exposure status, and ascertained whether the woman had ever been in each type of union, there was no specific probing on the reported date of the first union, to see whether, for example, someone reporting the first union as married had been in a common-law or visiting union before. In addition, there was no probing about possible unions preceding that reported as the first. One result of this failure to probe heavily for the first sexual relationship, as well as failure to ask for the date of first intercourse, in most of the sub-Saharan African and Latin American/Caribbean countries, is that the proportion of pre-union births is frequently at about 10 per cent, and occasionally, as high as 15-20 per cent, while the proportion of pre-union conceptions is even higher (see Goldman et al, forthcoming). These results strongly imply a need for additional probing, following the approach of Ivory Coast.

RETROSPECTIVE DATING OF MARRIAGES AND DISSOLUTIONS

Accurate dating of periods of exposure over the respondent's life time was a second aim of the marriage history. The percentage of time which is spent outside of unions after the first marriage, is usually between 10 to 15 per cent: this is not an insignificant amount of time lost, and since in additio important explanatory factor in analysis using the individual as the unit. It can become a particularly important factor if much of this time is lost early in the reproductive period, when its effect on fertility is greater. Correct dating of the beginning and ends of unions is important if this factor is to be a useful input into analysis.

A few pieces of evidence available on this subject suggest that some gaps in the coverage of unions still exist. A few countries which looked at the mean number of unions by age-groups found stabilization above age 35 (Tarquieu (forthcoming), Haiti, Singh (1983), Jamaica and Hunte (1983) on Trinidad an Tobago) or a small decline in the mean above age 45 (Dominican Republic: Guzman

(1980), Ecuador: Ines Herera de Rivadeneira (1984); and Paraguay: Schoemaker (1984)) a trend which strongly suggests that older women omitted some unions. In addition, in an analysis of 28 countries, comparison of Bongaarts indices of marriage based on exposure during the five year period before interview and on current marital status, suggests either that dissolution of unions was underreported in the last 5 years by about 5 per cent on average, or that current status reports omit some women currently in union: the first seems the more likely explanation (Casterline et al, forthcoming). Finally fertility outside reported unions, during the five years before survey, was estimated at about 7 per cent in Haiti and among Non-Indians in Trinidad and Tobago and Guyana, but was as high as 11 per cent in Jamaica even with extensive categories of union types identified (Ligthbourne and Singh, 1982 for Guyana and Jamaica, and our estimates for Haiti and Trinidad and Tobago).

Apart from problems of accurate recall of dates in the past, particularly where informal unions are concerned, another possible reason for inadequate coverage of unions is the definition of unions being used. Generally, most countries limited the definition of a union to one that involved living together, and where non-cohabiting unions were recognized, the implication of some degree of stability in the union was contained in the definition, eg the use of the phrase 'a steady partner' in the English-speaking Caribbean. In societies where informal unions occur, and where dissolution of unions is at a moderately high level, it is in any case to be expected that a proportion of conceptions and births will occur in the period between unions. Nevertheless, it is also likely that unions of a more temporary or casual nature than those allowed for by the usual definitions, exist.

One approach to dealing with this situation is to link the union and birth histories, either by combining them literally, or by obtaining the names of fathers of children in a separate birth history, and probing in the union history for fathers who are not reported as partners. An approach along these lines was used by Haiti, obtaining the name of the father of each pregnancy in the birth history, and the name of each partner, in the union history, as well as the names of children for that partner. The intention was that the interviewer should interrelate this information for probing, but in a practice this was apparently often not done. Nevertheless, Haiti has negligible pre-union fertility, unlike other countries with informal unions; however the per cent of births in the five years before interview, which occurred outside of union (7 per cent), was about the same as that of some other Caribbean

countries, although it was less than that of Jamaica (11 per cent). It is quite likely that the separation of the two histories made cross-referencing difficult. An integrated table, covering both births and marriages would make this approach more feasible, and may well be worth considering for some societies especially for the recent period.

USE OF PROBES IN OBTAINING DATES OF MARRIAGE

Apart from the general issue of defining what is to be measured, the form of questions and the use of probes to obtain dates is very important. The original core questionnaire did not specifically provide probes for cases where a calendar date was not known: the month and year alone were asked. This was presumably done with the intention of countries adding their own probes, where this was considered necessary. Indeed, several of the earlier countries did add detailed probing for dates, even before the 1977 Modifications to the Core Questionnaire recommended some probes: age, if the date of beginning unions was unknown, and duration of unions if the date of dissolution was unkown.

Although several countries used no probes at all, and in these cases the interviewer and respondent together estimated a year, it would be preferable to have the information recorded in the form in which it was reported, rather than require the interviewer, under the preassures of the interviewing situation, to convert age, years ago or durations into calendar years, unless an age-event char is used. Provision of space in the questionnaire for recording information in at least two possible forms, if not specification of all possible probes, would seem desirable, especially where it is already known or expected, that obtaining dates would be problematic. This would avoid the situation where interviewers sometimes enter
two different types of answers (eg in Nigeria, calendar year and years ago) in the same place, because separate spaces had not been provided. The event chart is also clearly a useful aid for dating of marriages, because it allows easy checking of the consistency of the other events against marriages, and use of other events to help in the estimation of dates of marriage.

The quite high proportions of women who did not give a calendar year for marriages/unions, seen for some countries where this information was recorded, strongly supports the need to probe for dates (see Chidambaram and Sathar, forthcoming). Examination of cases where more than one probe was used showed

that substantial proportions of women respond to each consecutive probe, and in the case of Benin, where a final code of 'don't know' was allowed, almost 5 per cent of women still were unable to answer after calendar date, age and duration were asked.

While the use of two or even three consecutive probes for 'don't know' cases is clearly useful, obtaining several measures of the same event for each woman is obviously not an useful approach. While it allows the possibility of cross-checking dates, in the end some ranking of types of answers will have to be used, to decide on a single value where inconsistent results are obtained, and this ranking may just as well be introduced in the questions. This could in fact complicate greatly data processing and date inputation. Thus, it seems that unless multiple recording of dates is being done for a special experimental purpose, it may be simpler to use alternative forms of dating only as probes for 'don't knows'.

PROBES ON CURRENT MARITAL STATUS

Probes on current marital status were used by most countries which had all-women samples. These would also be countries where informal unions occur: it may therefore be possible for women to report themselves as never in any union, or currently not in a union, even though they are actually in an informal union, because they consider that the interviewer may not be interested in recording these types of unions. Single women could be asked whether they had lived with someone before (or had a union before) and if so, whether they were currently living with someone. A third question is either to ascertain the age at first intercourse separately from questions on marriages/unions, or to ask single women who had never lived with anyone whether they had ever had sexual relations. In addition to probing single women about their exposure status, a few countries also asked women who were currently separated, widowed or divorced, whether they were currently living with someone.

The results of using these probes, in a few African and Latin American countries, is shown in table 2. The usefulness of the probes varies widely. In three cases a substantial number of women who would otherwise have been incorrectly classified as never in union or not currently in union, were located by the added probes (Ivory Coast, Costa Rica and Panama), and in one case (Cameroon), where about half of all never-married women had had sexual

intercourse, probes on union status, had they been used, may have found that some of these women had been in unions also. However in all other countries (8 out of the 12 which used one or more of these probes), the number of women found to be incorrectly classified was very small, usually under ten.

These results suggest that there is a place for probes in some countries. Their failure in other countries may be due to differences in interviewers's training in the use of these questions and awareness of their importance. Alternatively, differences in marriage/union systems between countries could have produced a genuine difference in the need to use these questions: informal unions or pre-marital relationships may not exist or women could have had no hesitation in reporting those unions, from the initial question on current union status. It is worth noting, however, that the Latin American countries with low responses asked only one of the four possible probes, and it is possible that inclusion of more of these probes could have obtained different results. While it is possible, in societies where extra-marital fertility is high, that these probes will introduce some pressure on women to answer yes, it is still worthwhile to use these probes to maximize coverage and moreover it is easy for analysts to omit unions shorter than some minimum durations, since the duration of all unions would have been recorded. In conclusion we recommend that all countries where informal unions occur with some frequency should take these results into consideration when designing further surveys, especially for those countries with similar marriage/union systems. In addition, all such countries should seriously consider including a question on the age at first intercourse, for all women.

PROBE ON THE STATUS OF CURRENTLY MARRIED WOMEN

The core questionnaire included a check question probing all women who said they were currently married, primarily in order to see whether they were in fact permanently separated. Women were asked if their husband ordinarily lived in their household, and if not, whether he was away for the time being, or whether they had stopped living together for good. Most countries followed this question sequence exactly as recommended. The results, shown in table 3 for available cases, suggest that the questions were not justified for the reason they were used, that is, to identify women who report that they were currently married, but who were actually separated. Where the core questions were used as recommended, the number of such women who were located was negligible - 0 in cases, under 10 in 7 cases, under 20 in 10 cases and slightly over 20 in 2 other cases.

However, the first question in the sequence, whether the husband was resident in the same household, obtained a significantly high level of response - usually about 5 per cent of currently married women were temporarily separated, and in a few countries, as many as 20 per cent of women (in Lesotho, 33 per cent) were in this situation. While these separations may be of relatively short duration, it is also possible that some proportion of these women may prefer to report a separation as temporary, when it is of substantial duration and likely to end in permanent separation, because they hope to save the union or marriage. We should recall that the first question asks whether the husband 'ordinarily' lives in the household, not whether he is away at the time of interview: it seems that these reported separations are therefore unlikely to be simply current and very short-term absences. These results do show, however, that a significant level of separation exists in most countries, and some probing may be therefore necessary. An objective approach to measuring separation may be better: a currently married woman could be asked whether her husband is not living in the household at the time of the interview or not visiting her regularly (in the case of the Caribbean and in African polygamous unions), and if so, how long has he been absent. Data analysts could then decide how to make use of the reported durations of absence. An additional question could be asked on the reason for the separation. Some measurement of separations, perhaps more detailed, is mandatory in countries where as many as 10 per cent or more of currently married women are separated at the time of the survey. However it is also likely to prove useful in the average case where 4-5 per cent of women are separated, especially if these women are concentrated at the younger, more fecund ages, which would well be the case when separations are brought about due to employment conditions.

These probe questions also brought into focus the need for allowing for the situation in some African countries where the couple live in separate households. Depending on the type of household structure, this type of living situation may make questions on frequency of intercourse even more useful. Where the 'separation' is simply an artefact of the WFS' type of definition of household, and couples live in the same housing compound, this may not be an important factor. But if separate households implies living in different compounds, (as for example among polygamous wives in some parts of Nigeria) then this could be an important factor. These results suggest that there is a definite need for better recording of the living situation, in any case, in these societies.

POLYGAMY

When the questionnaire instruments were originally being designed, the idea of developing a module on this topic was considered. However this was not done, and each country took its own preferred approach. This could have resulted in wrong decisions and non-comparable data between countries. In general, however, countries opted for the same questions, the number of co-wives (all nine countries which included the topic) and the rank of the respondent among the wives (7 of the 9 countries). Two unfortunate omissions occurred - rank was not asked in Ghana, and rank of married women only was asked in Senegal, not of women in consensual unions. Two of the latest surveys, in Benin and Nigeria, went further and obtained the number of co-wives in each earlier union, which may be a useful addition for future surveys. It is not clear that a special module is called for, since the questions are few and simple; however the existence of a standard set may have avoided the two omissions described above.

5. SUMMARY AND RECOMMENDATIONS

This paper has critically examined WFS practice in the questions and techniques for measurement of the main demographic events covered by these fertility surveys - age in the household and individual surveys, the retrospective birth or pregnancy history, and nuptiality, both current and past. Although we expressly looked for the advantages and disadvantages of WFS questions and techniques using the results of the surveys themselves, a few relevant experimental studies as well as the subjective experience of data collectors, this is not to deny the fact that a great deal of effort went into the initial design of the core questionnaire, and into subsequent country - specific modifications. However the evidence of this assessment shows that many deficiencies in the data resulted from question design.

In obtaining age, it is clear that the low quality of household data is partially due to the insufficient emphasis placed on designing the relevant questions, as compared to the individual survey. This is seen in the fact that only 12 countries asked date of birth for household members while all countries did so in their individual surveys. However in both the household and individual surveys better question design is necessary to improve the quality of data collected and to avoid interviewer effects such as misuse of instructions, transference of data and reconcilation of inconsistencies.

The use of the full birth history and the results obtained by the WFS approach are probably the major and most important WFS contributions to fertility surveys. The technique of the integrated birth and pregnancy history table has given good results both on coverage and dating. It is difficult to evaluate exactly the relative success of the different variations (segment, intervals or chronological approach) of this technique. However, its superiority on the recommended format of two separate tables is an undisputed fact and its matching with the use of the AGEVEN chart technique has been found useful for increasing both consistency and accuracy of the data. In contrast to this success the detailed set of questions on non-live births has failed to fullfil its original purpose (better coverage of live-births) and therefore should be reconsidered.

WFS surveys used a very wide definition of 'marriage', including all informal unions. This proved successful in Latin America and the Caribbean, where typologies of union types already existed and were well-known. However, in Africa, where the standard marriage history section was used for most countries, because of the lack of appropriate typologies and also because of failure to exploit existing anthropological and sociological knowledge on nuptiality, this was clearly an inapproriate decision. The type of union or marriage system itself influenced the questions which were used to obtain marital status and the dates of unions. Thus, use of probe questions improved reporting of the date of the first union, current marital status and consequently measurement of exposure. Nevertheless it is clear from the results obtained that problems in the definitions of unions and in question design continue to exist (e.g. confusion between the date of formal marriage and the date of consummation, failure to probe for unions of brief duration, especially before the first reported union, and failure to recognise types of unions other than marriage in most African countries).

It is unfortunate that, in the absence of experimental research, we cannot make conclusive recommendations. However we think that many of these problems can be solved by improvements in the design of questions. Therefore we make the following recommendations, recognising that their relevance and feasibility will depend on the particular circumstances of each country.

Recommendations:

1. More effort should be spent on obtaining a good estimate of age in the household, preferably for all members, but at least for women who could be in the eligibility range e.g. 10-55.

   We suggest that consultation of documents should be written into the questionnaire, with rules about their use tailored to suit each country's own situation. The alternative would be date of birth and age, with reconciliation of differences by the interviewer occurring in a third location. We also suggest that the phrase "in completed years" should be printed in the questionnaire, as a reminder to the interviewer of what is to be obtained or estimated. Where thorough questioning of this kind is used, and the respondent is the eligible woman herself, then the age/date of birth can be transferred to the individual questionnaire. A similar set of questions is recommended in the individual questionnaire, for cases where the woman was not the household respondent.

2. Biases in the selection of individual respondents from the household interview are common. The marital status bias can be handled by including single women on the individual survey, perhaps with a special short questionnaire. This would also have the extremely valuable advantage of simplifying the analysis of fertility and nuptiality data. The bias at the upper end of the age range, in the age-group 45-59 can be dealt with either by making the selection of women from the HH survey independent of the interviewers for the individual survey, or by expanding eligibility to 50-54. The second step is to be recommended for in-depth fertility surveys, when past trends are of interest. For surveys focusing on the current situation, the 45-59 age-group contributes little, and therefore errors in coverage are less important.

3. We recommend that the use of the birth history should be continued. Where the quality of dating events is known to be poor, or where there is substantive interest in the level of foetal wastage or induced abortion, then an integrated history is recommended, rather than addition of a separate non-live-birth table. If non-live-births are being obtained as an aid in dating live-births, then duration of the pregnancy and the birth interval in which it occurred are all that is needed. The 'Backward' maternity history may have a slight advantage over the 'Forward' or chronological structure.

Again, we recommend, even more strongly than for obtaining the ages of adults, that consultation of documents be written into the birth history.. The importance of obtaining the exact age at death, in months and years, and not to lose this detail by grouping ages, is stressed.

Aids in dating events are recommended in some situations. Field experience supports the suggestion than an age-event chart be used wherever dating events is difficult, and perhaps where knowledge of dates is good but an informal union system exists. The conversion chart, of the Takeshita type, is useful where knowledge of dates is high but dates may be reported in two or more calendar (or other) forms.

4. Probing on current and past marital status, for all-woman samples, is highly recommended. The probe on separation status of currently married women did not seem useful for the reasons it was designed, but revealed a moderate to high level of separation in many countries. We suggest that consideration should be given to establishing the duration of current separation of women who are nevertheless actually married.

Dating of the first marriage in countries where either living together occurs before marriage, or consummation occurs after a formal marriage, needs special probing. We suggest that the dates of each event should be obtained, or one date and the duration to the next, as the surest way of avoiding the possibility of confusing the two. Despite all efforts made so far, some improvements in probing for the date of the first relationship can still be made in societies where informal unions are common. Apart from added probes, the age-event chart may assist in coverage and dating of unions, by allowing a visual consistency check of dates of unions and births. Another possibility is to have an integrated union and birth history.

We recommend that the marriage/union history be kept as part of the questionnaire. Information on marriage and union patterns and changes in these over time, is important in its own right (e.g. for legal and social welfare matters); but in addition, changes in exposure will be increasingly important as an explanatory factor in fertility change, as modernisation increases. It would be a great advantage to be able to study trends by combining WFS surveys with any future studies. Moreover, it is worth maintaining the history even where there is little dissolution, for purposes of

comparability, since in such countries, little interviewing time will be lost on this section.

Finally, especially for the African countries, design of the section on marriage should make use of existing anthropological and sociological material on nuptiality.

5. This paper shows that experimental research is crucial if we are to improve survey methodology in general and question design and content, in particular. Experimental studies can be carried out with little extra cost, if they are incorporated into the pretest or into the main survey, and are therefore to be recommended.

Table 1 Use of some questions and techniques for dating events, by 41 WFS surveys

Country	Household survey		Individual survey								
	Age	Date	Respondent's date of birth		Type of birth history[1]	Non-live pregnancies dating[2]		Use of event chart	Use of conversion chart	Eligibility for individual survey	
			Date	Age[3]		(A)	(B)			Age	Marital status[4]
AFRICA											
Benin	✓	✓	✓	A	B	x	✓	✓	x	15-49	ALL
Cameroon	••	✓	✓	A	C1	✓	x[5]	x	x	15-54	ALL
Ghana	✓	✓	✓	A	B	✓	✓	x	x	15-49	ALL
Ivory Coast	✓	x	✓	A	C1	✓	x[5]	✓	x	15-50	ALL
Kenya	✓	✓	✓	A	B	✓	✓	x	x	15-50	ALL
Lesotho	✓	x	✓	A	B	✓	✓	x	x	15-49	EM
Nigeria	✓	✓	✓	A	B	x	✓	✓	x	15-49	ALL
Senegal	••	✓	✓	x	C3	✓	x[5]	✓	x	15-49	ALL
Egypt	✓	x	✓	A	C2	✓	✓	✓	x	-49	EM
Mauritania	✓	x	✓	A	C2	✓	✓	✓	x	12-50	EM
Morocco	✓	x	✓	B	B	✓	✓	✓	x	15-50	ALL
Sudan (N)	✓	x	✓	A	B	✓	✓	✓	x	-50	EM
Tunisia	✓	x	✓	A	B	✓	✓	x	x	15-49	EM
ASIA & PACIFIC											
Jordan	✓	x	✓	B	A	x	✓	✓	x	15-49	EM
Syria	✓	x	✓	B	C1	✓	✓	✓	x	-49	EM
Turkey	✓	✓[1]	✓	A	B	✓	✓	✓	x	-49	EM
Yemen A.R.	✓	x	✓	A	B	✓	✓	✓	x	-50	EM
Bangladesh	••	✓	✓	B	C2	✓	✓	x	x	-49	EM[6]
Nepal	✓	x	✓	B	B	✓	✓	x	✓	15-49	EM
Pakistan	✓	x	✓	B	A	✓	✓	x	x	-50	EM
Sri Lanka	✓	✓	✓	B	A	✓	✓	x	x	-49	EM
Fiji	✓	x	✓	A	A	✓	✓	x	x	15-49	EM
Indonesia	✓	x	✓	B	B	x	✓	✓	x	10-50	EM
Korea P of	✓	✓	✓	A	B	✓	✓	✓	✓	-50	EM
Malaysia	✓	✓	✓	B	B	✓	✓	x	✓	-49	EM
Philippines	✓	✓	✓	A	D1	✓	✓	x	x	15-49	EM
Thailand	✓	✓	✓	B	A	✓	✓	x	x	-49	EM
AMERICAS											
Colombia	✓	x	✓	A	A	✓	✓	x	x	15-49	ALL
Ecuador	✓	x	✓	A	A	✓	✓	x	x	15-49	ALL
Paraguay	✓	x	✓	A	D2	✓	✓	x	x	15-49	ALL
Peru	✓	x	✓	A	A	✓	✓	x	x	15-49	ALL
Venezuela	✓					✓	✓	x	x	15-49	EM

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Country	Household survey: Age	Household survey: Date	Individual survey: Respondent's date of birth: Date	Individual survey: Respondent's date of birth: Age[2]	Individual survey: Type of birth history[3]	Individual survey: Non-live pregnancies dating[4]: (A)	Individual survey: Non-live pregnancies dating[4]: (B)	Individual survey: Use of event chart	Individual survey: Use of conversion chart	Individual survey: Eligibility for individual survey: Age	Individual survey: Eligibility for individual survey: Marital status[5]
Costa Rica	✓	X	✓	A	A	✓	✓	X	X	20-49	ALL
Dominican Rep	✓	X	✓	A	D2	✓	X[*]	X	X	15-49	ALL
Mexico	✓	X	✓	A	D2	✓	X[*]	X	X	20-49[6]	ALL
Panama	✓	X	✓	B	A	✓	✓	X	X	20-49	ALL
Guyana	✓	X	✓	B	C1	✓	X[*]	X	X	15-49[7]	ALL
Haiti	✓	X	✓	A	C3	✓	X[*]	X	X	15-49	ALL
Jaimaica	✓	X	✓	B	C1	✓	X[*]	X	X	15-49[7]	ALL
Trinidad & Tobago	✓	X	✓	B	C1	✓	X[*]	X	X	15-49[7]	ALL
EUROPE											
Portugal	✓	X	✓	A	B	✓	X[*]	X	X	15-49	EM

Source: S. Singh, 'Comparability of questionnaires in 41 WFS surveys' WFS Cross National Summaries, forthcoming.

✓ Obtained information
X Not asked
X* Not asked, but could be obtained from date of termination
** Asked as a probe, if date unknown
[1] Year only, not month
[2] A = age asked of all women; B= age asked only if respondent did not know date of birth
[3] A = core questionnaire; B = Table integrated, but first all live-births, then non-live births for each birth interval;
C(1) = Fully integrated pregnancy history - total number of pregnancies obtained, and questioned sequentially;
C(2) = alternating live birth, then non-live pregnancies in that interval; C(3) = c(1), except reverse chronological order for questions on birth;
D(1) and D(2) = segmented histories = first all living children, then all dead children' then all non-live pregnancies (sometimes split into two groups), but all entered in one physical table in approximate chronological order
[4] Column A shows if the actual date of termination was asked, while Column B shows whether the interval within which the non-live pregnancy occurred, was also asked.
[5] ALL = all women; EM = Ever-married women only. EM includes informal unions, where these are common.
[6] Plus all women aged 15-19 who had had a live birth or been in a union
[7] Excluding full-time schoolgirls aged 15-19
[8] Consummated marriages

Table 2. Consistency in age reporting, between household and individual surveys, depending on type of household survey, and on question format

Countries	Household			Individual			Consistency	
	Type[1]	Age only	Date and age	Month & year	Year only	Age	Single years	5-year Age-groups
Colombia	Ex	x		97.0			61.3	88.7
Dominican Rep.	Ex	x		85.9	14.1	-	64.5	87.7
Mexico	Ex	x		100.0[a]			67.1	-
Tunisia	Not Ex	x		88.2	11.8	99.0[b]	66.3	-
Indonesia	Not Ex	x		22.3	11.2	66.5	80.8	93.4
Malaysia	Not Ex		x	57.0	43.0	-	97.3	-
Philippins	Not Ex		X	97.3	2.5	0.2	-	98.0
Trinidad & Tobago	Not Ex	x		98.3	-	1.7	97.9	99.7
Peru	Not Ex	x		94.7	5.3	-	98.0	99.0
Turkey	Not Ex		x		72.0		78.5	93.5

[1] Type of household survey: 'extended' means that a larger sample was used, with a subselection of households being used to yield eligible women for the individual interview. 'Not-extended' refers to survey whose the number of households in the sample was limited to those needed to yield the desired number of women for the individual survey.

[a] Age was asked of all women, at a separate point in the interview, regardless of whether a calendar date has already been obtained

Table 3 Results of probing women who are either never married or not currently married

Country	Single		Sep/Wid/Div	Had sexual relations though never in a union
	Lives with someone now	Lived with Someone before?	Living with someone now?	
Benin	7/452	4/452	21/133	NA
Cameroon	NA	NA	NA	406/827
Ghana	0/1179	NA	8/517	NA
Ivory Coast	141/1004	89/1004	86/346	NA
Kenya	1/869	9/869	NA	NA
Senegal	7/522	2/522	9/180	56/522[1]
Costa Rica	27/1007	82/1007	31/376	257/1007
Panama	20/555	37/555	52/531	68/555
Mexico	NA	0/1055	NA	NA
Dominican Rep	NA	4/862	NA	NA
Venezuela	NA	0/1645	NA	NA

[1] 56 single women had one or more children. Number who had sexual relations is probably higher.

Table 4 Results of the probe questions on the status of currently married women

Countries	Husband lived in same household	Sep. households, sees him regularly	Temporarily separated	Union ended	Currently married
AFRICA					
Benin	3104	277	69	11	3450
Cameroon	5728	-	325	10	6053
Ghana	3140	1078	208	4	4426
Ivory Coast	4193	413	36	0	4642
Kenya	4566	121[1]	993	13	5680
Lesotho	1940	-	1211	9	3151
Nigeria					
Senegal	2922	361	-	16	3283
Mauritania	2298	-	603	6	2907
Morocco	3453	-	227	15	3680
Sudan (N)	2630	-	226	0	2856
ASIA & PACIFIC					
Syria	4239	-	73	0	4312
Yemen A.R.	1960	-	490[4]	0	2450
Bangladesh	5484	-	266	22	5750
Sri Lanka	6052		129	14	6181
Indonesia	7739		235	10	7974
Malaysia	5473		333	NA	5806
Philippines[3]	5958		728	1	6687
AMERICAS					
Colombia	2775	-	52	15	2827
Peru	4785	-	256	18	5041
Venezuela	2101	-	179	0	2280
Costa Rica	2545	-	81	8	2626
Dominican Rep.	1739	-	45	24	1784
Mexico	5537	-	103	1	5640
Panama	2517	-	134	1	2651
Guyana	2298	-	-	216[2]	2298
Jamaica	882	-	-	81[2]	2290
Trinidad & Tob.	1892	-	-	201[2]	3104
Portugal	4750	-	143	19	4893

1 In Kenya, the code is 'staying with you at the moment', ie a temporary relationship, but not involving separate households.

2 Only married women were asked, and all who were not currently living together were considered to be separated. Commonlaw and visiting women were omitted.

3 Curr. married, not pregnant and has resumed sexual relations were those asked this question

4 406 abroad, 84 temporarily separated, living in the country

4 406 living abroad; 84 temporarily separated, living in the country

Figure 1A. Indonesia - Age event chart

Events chart used in the Indonesia Fertility Survey

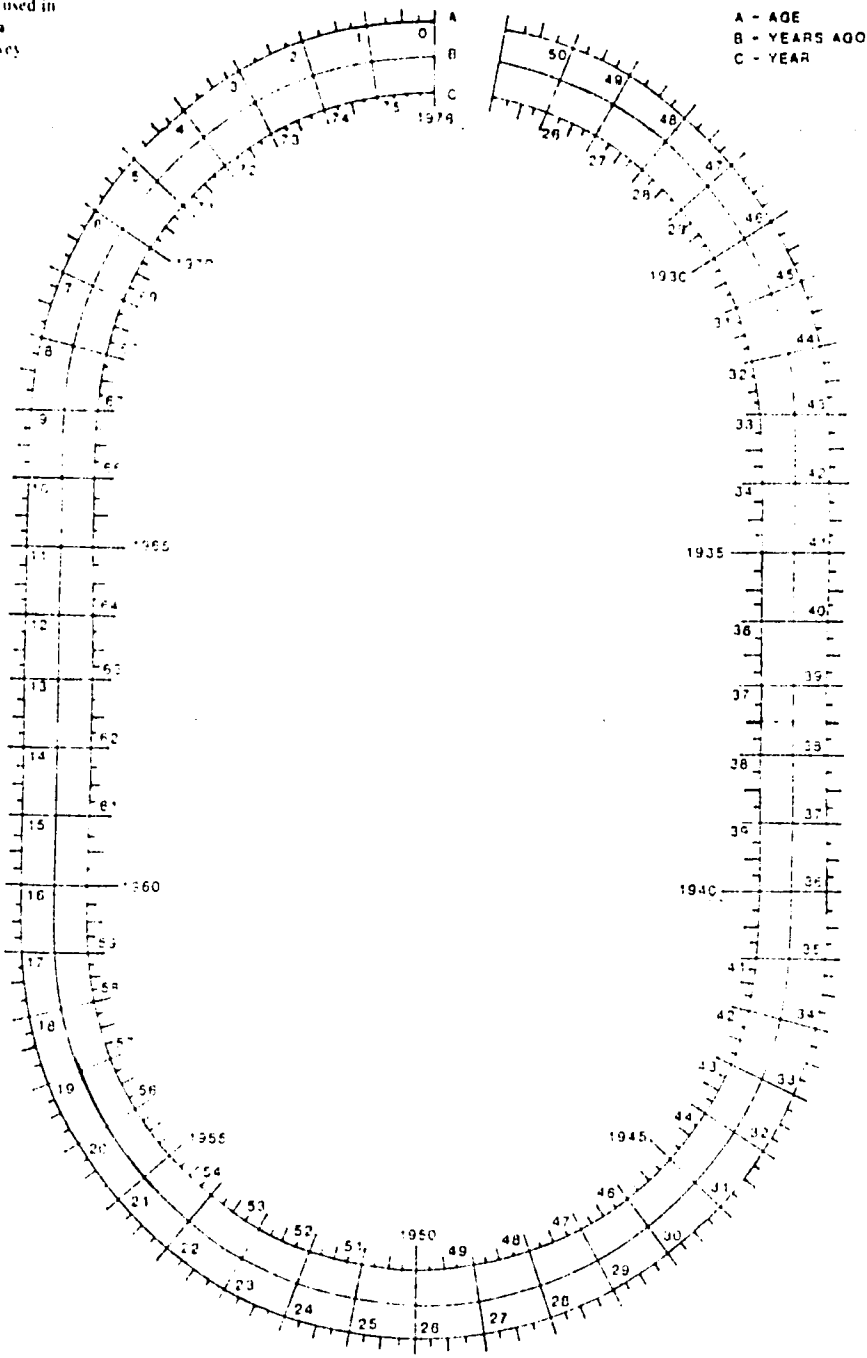
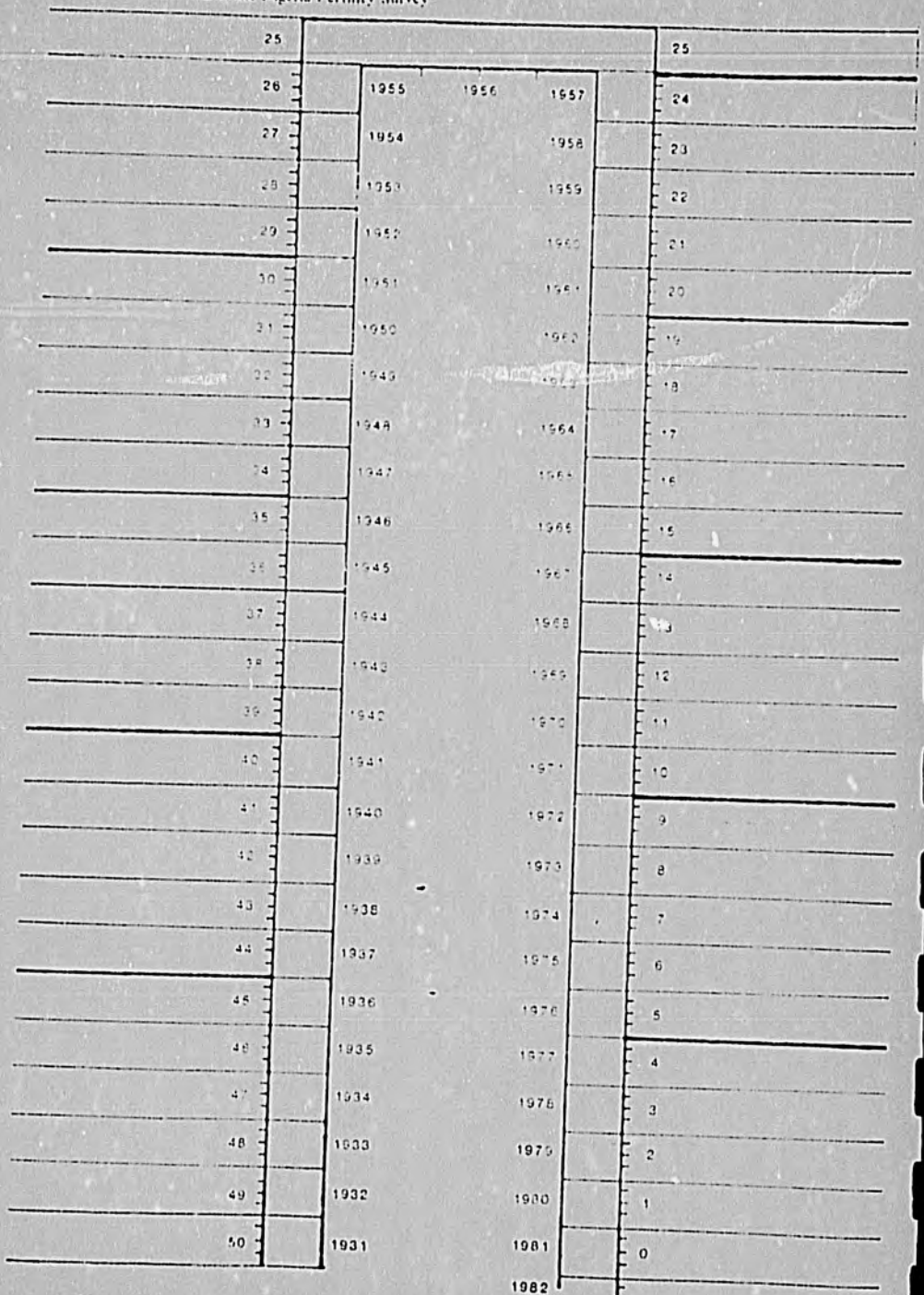


Figure 1B. Nigeria - age-event chart

Date - event chart used in the Nigeria Fertility Survey



M - Mariage de l'enquetêé
FM - Fin de mariage de l'enquetêé
DN - Naissance de l'enquêtée
NE - Naissance de l'enfant

ز تاريخ زواج المستجيبة
تاريخ نهاية زواج المستجيبة
مرم تاريخ ميلاد المستجيبة
مرو تاريخ ميلاد الولد

Figure 1C. Mauritania

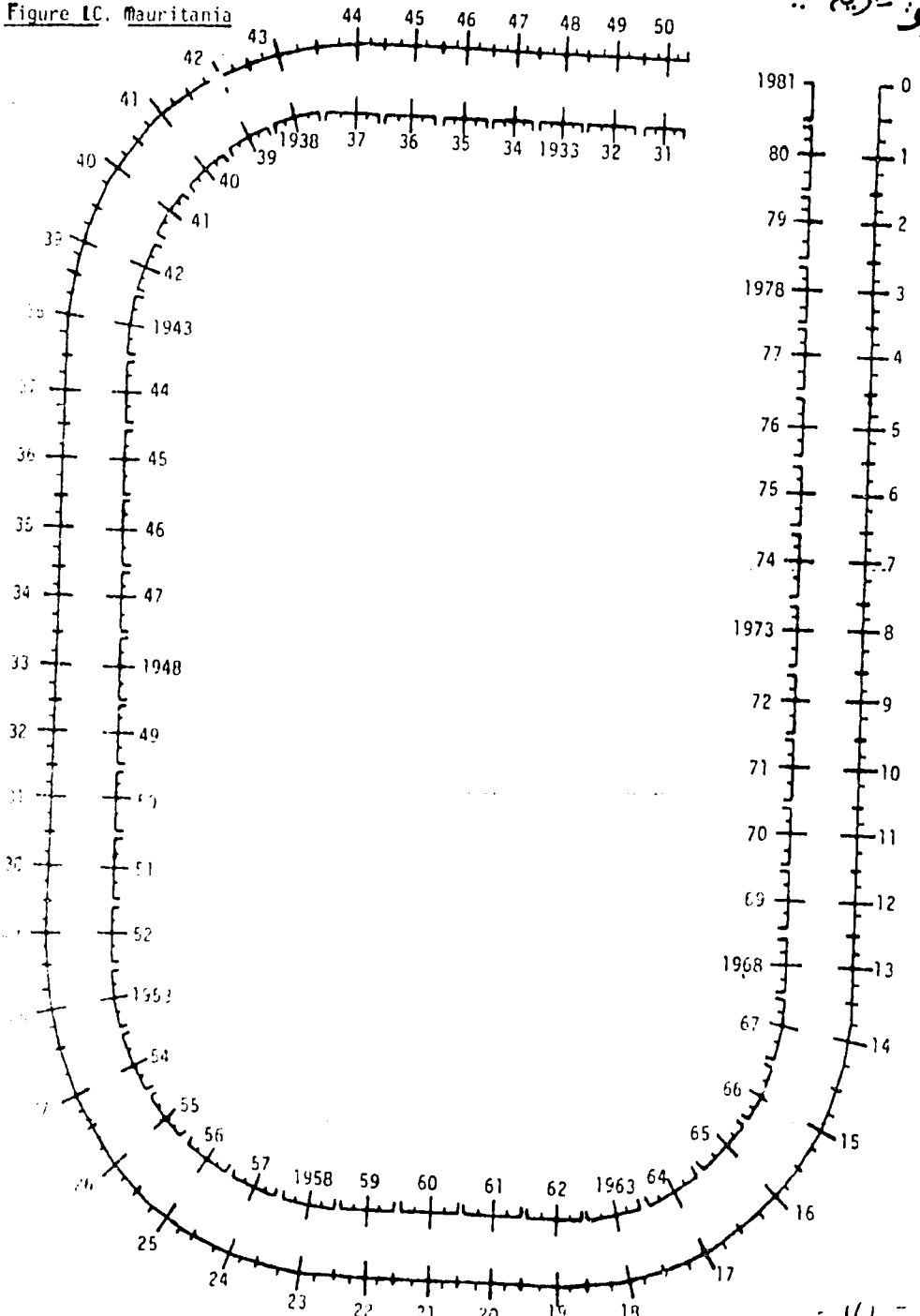
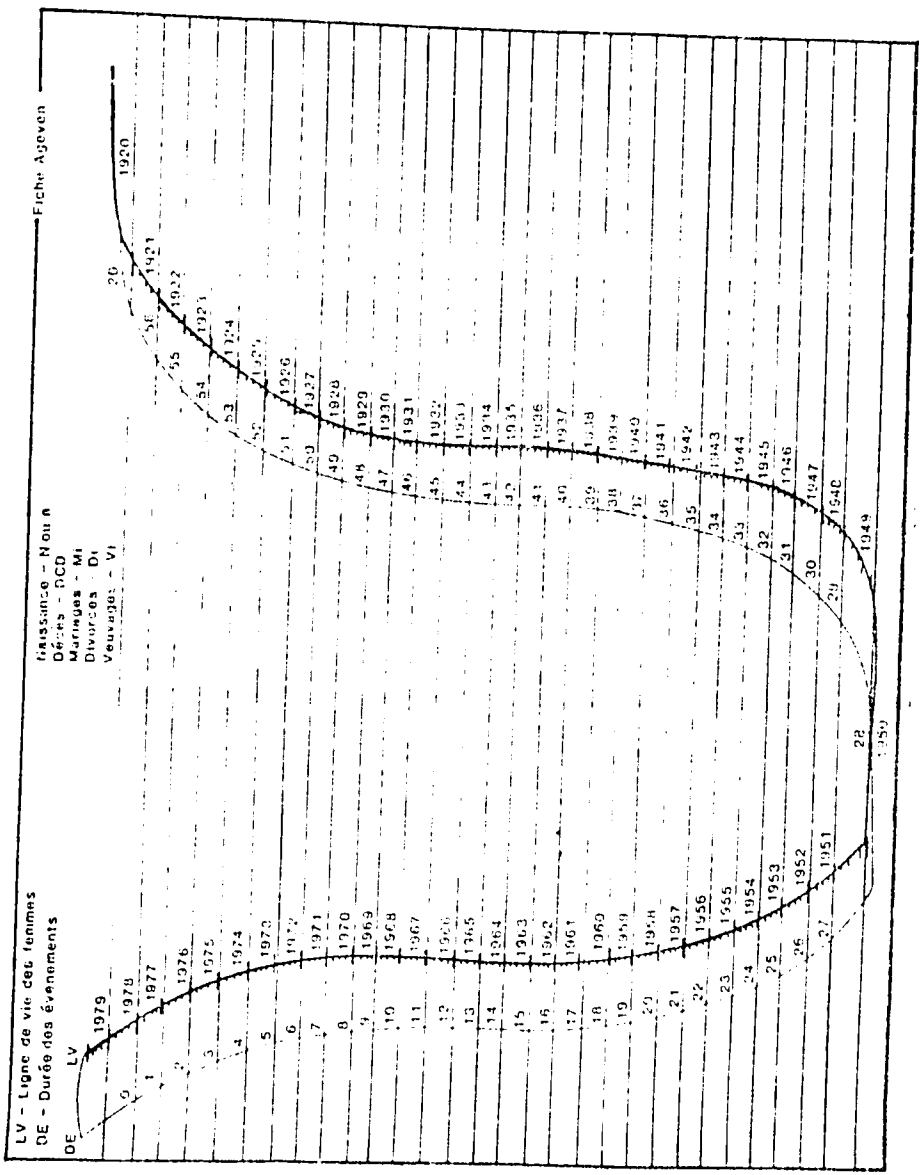


Figure 1D. Senegal - age-event chart



Age-event chart (fiche agevent) used in the Senegal Fertility Survey

Figure 1E. Korea - conversion chart of the Takeshita type

NONFERTILE PREGNANCY CHART 1947-1958: PLOT ON EVENTS CHART

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