



Demographic Research a free, expedited, online journal
of peer-reviewed research and commentary
in the population sciences published by the
Max Planck Institute for Demographic Research
Konrad-Zuse Str. 1, D-18057 Rostock · GERMANY
www.demographic-research.org

DEMOGRAPHIC RESEARCH

SPECIAL COLLECTION 1, ARTICLE 1

PUBLISHED 19 September 2003, PAGES 1-30

www.demographic-research.org/special/1/1/

DOI: 10.4054/DemRes.2003.S1.1

Research Materials

***Introduction to: Social Interactions
and HIV/AIDS in Rural Africa***

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This special collection is edited by Susan Watkins, Eliya M. Zulu, Hans-Peter Kohler and Jere Behrman. The papers in this special collection were presented at the conference "Research on Demographic Aspects of HIV/AIDS in Rural Africa", held at the Population Studies Center, University of Pennsylvania, October 28, 2002.

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Table of Contents

1	Introduction	2
2	Authors and collaborators	3
3	Papers	4
4	Data	5
4.1	Malawi survey design	6
4.2	Malawi qualitative data	8
4.3	Kenya survey design	9
4.4	Kenya qualitative data	10
5	Data quality	11
6	Conclusion	19
	Notes	21
	References	22
	Appendix	28

Research Materials

Introduction to *Social Interactions and HIV/AIDS in Rural Africa*

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Abstract

This paper introduces a set of papers presented at the conference “Research on Demographic Aspects of HIV/AIDS in Rural Africa”, held at the Population Studies Center, University of Pennsylvania, October 28, 2002. The aim of the conference was to provide a forum for the presentation of results, to an audience of experts, on a variety of demographic aspects relevant for the study of HIV/AIDS in rural Africa. The aim of this volume is to provide these results to a wider audience. Although the topics covered are diverse, ranging from methodological issues in the study of HIV/AIDS such as sample attrition to substantive issues such as fertility, divorce, and women’s autonomy, the papers are united by their use of two similar data sets collected in rural Malawi and Kenya. This introduction thus begins by briefly describing the contents of the volume and the collaborators, and then focuses on a detailed description of the data used by all authors and on the threats to data quality. We conclude that other demographic studies of HIV/AIDS in rural Africa are likely to face similar threats, and that these should be routinely discussed.

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1. Introduction

This volume contains a set of papers presented at the conference “Research on Demographic Aspects of HIV/AIDS in Rural Africa”, held at the Population Studies Center, University of Pennsylvania, October 28-29, 2002, and supported by the TransCoop Program of the German-American Academic Council. All of the papers use data from two similar studies, the Malawi Diffusion and Ideational Change Project (MDICP) and the Kenya Diffusion and Ideational Change Project (KDICP). The aim of both these projects was to examine the influence of social networks on the adoption of family planning and on AIDS-related attitudes and behavior. In this volume the focus is on demographic aspects of rural Africa relevant to research on the AIDS epidemic. We begin by introducing the authors and project collaborators and by describing the two data sets. We then discuss the quality of the data.

The unity of this volume comes from the use of two similar data sets. These data provide an unusual window onto demographic aspects of two countries with among the highest levels of HIV prevalence in the world. Some of the unusual features of the data are:

- * Social networks: The data include information on social networks that were expected on theoretical and empirical grounds to play a role in the dissemination and evaluation of information about HIV and how it can be prevented as well as to exert social influence on responses to the epidemic.
- * Re-interviews with respondents, which permit assessing change in AIDS-related attitudes and behavior. Survey respondents were interviewed in 1998 and 2001 in Malawi (with future rounds scheduled for 2004 and 2006), and in 1994-95, 1996-97 and 2000 in Kenya.
- * Rural married couples: The study covers the largest category of people who are at risk of infection with HIV: ever-married men and women living in rural areas, areas that are similar to high-prevalence rural populations in other countries of southern Africa.
- * Quantitative and qualitative data: The survey data permit analyses of central tendencies, variation, and their determinants; qualitative data provide perspectives not available through survey methods of the men and women who are facing an epidemic of a fatal disease.

2. Authors and collaborators

The production of this volume was a collaborative effort. The authors are:

*Principal investigators on various components of the project; Behrman, Kohler, Watkins, Weinreb and Zulu

*Graduate students who are, or were at the time, in the demography program at the University of Pennsylvania and postdoctoral fellows at the Population Studies Center: Simona Bignami-Van Assche, Amy Kaler, Claire Noel, Georges Reniers, Enid Schatz, Kirsten Smith, Ina Warriner and Alex Weinreb

*Colleagues elsewhere: Michael Bracher, Christoph Bühler, Gloria Chepngeno and Gigi Santow

We are grateful to the discussants for their unusually active role in contributing to the quality of the papers in this volume: Victor Agadjanian, Ann Blanc, Shelley Clark, Francis Dadoo, Jennie Godley, Simon Gregson, Joseph de Graft Johnson, Iliana Kohler, Nancy Luke, Amy Tsui, and Etienne van de Walle.

The MDICP has institutional affiliations with the African Population and Health Research Center (APHRC), the University of Malawi (the College of Medicine, the Centre for Social Research and the Demography Unit, Chancellor College as well as Kamuzu College of Nursing). Our Malawian colleagues were: Agnes Chimbiri (University of Waikato, New Zealand and currently College of Medicine, University of Malawi); Chiweni Chimbwete (Demography Unit, University of Malawi and currently Africa Research Centre, KwaZulu Natal, South Africa), Angela Chimwaza (University of Pennsylvania School of Nursing and Kamuzu College of Nursing, University of Malawi), and Mike Mtika (University of Alaska-Anchorage and currently Eastern University, Philadelphia, PA). The KDICP collaboration was with David Wilkinson of Innovative Communication Services/Systems and Alan Ferguson of GTZ/Ministry of Health; Naomi Rutenberg (Population Council) was Co-PI for the first round.

We were fortunate in attracting a highly qualified group of field supervisors and data entry specialists, many of whom participated in more than one phase of data collection and some of whom participated in subsequent email discussions of data analysis and interpretation. In both studies, the majority participated for more than one round of data collection, providing useful continuity in training interviewers and field procedures. For Malawi these were Frasier Botha, Henry Doctor (Project Coordinator in 2001), Stephen Jana, Jenala Kayira, Mathews Phiri, Christopher Manyamba, Harry Mkamanga, Moses

Mkandawire, Cecelia Makupe, Esnat Mdolo, Rose Misi, Stawa Shaibu, Chrissie Thakwalakwa and George Zulu; for Kenya they were Francis Ayuka and Charles Onoka (project directors) and Teresa Akoth, George Auko, Marcellus Ayuma, Catherine Odindo, Phoebe Ogalla, Rena Otieno, Mark Dan Owuor, and Ruth Waswa.

Others who participated in data collection or analysis were graduate students at the University of Pennsylvania, including its medical school, at the time of fieldwork, unless otherwise noted. For Malawi, these are Ria Baker, Sarah Hayford, Patrick Gerland (Princeton), Nancy Luke, Li Nam (Medical School), Tarcisius Nitta (Daystar University, Kenya), Matthew Schenker (Medical School), Kurt Spiridakis (undergraduate), Amy Simmerman (undergraduate), Linda Tawfik (Johns Hopkins) and Ina Warriner, and for Kenya Laura Bernardi (Max Planck), Sam Clark, Nadra Franklin, Steven Green, Nancy Luke, Enid Schatz and Kevin White. Also active in fieldwork were Julia Behrman, Gloria Chepngeno (APHRC), Julia Cotts, Megan Cotts, Tchaka Ndhlovu, and Thokozani Kanyerere.

Funding for the research in Kenya and/or Malawi was provided by USAID's Evaluation Project, the Rockefeller Foundation, NICHD (RO1 HDD MH41713, RO1 HD 37276), NIA (through the Population Aging and Research Center at the University of Pennsylvania), the Center for AIDS Research at the University of Pennsylvania, the TransCoop Program of the German-American Academic Council, and the University of Pennsylvania's Research Foundation.

3. Papers

All of the papers consider either methodological or substantive issues. The papers with a methodological focus are by:

- *Simona Bignami-Van Assche, who takes advantage of a set of duplicate interviews conducted in the space of three weeks to examine the consistency of survey responses in Malawi.
- * Simona Bignami-Van Assche, Georges Reniers and Alex Weinreb, who use both Kenya and Malawi data to examine several methodological issues: interviewer effects, question reliability and sample attrition.
- *Enid Schatz, who compares the measurement of women's status and autonomy in the Malawi household survey with qualitative interviews she conducted with a sub-sample of the household sample in Malawi.
- *Susan Watkins and Ina Warriner, who assess the selectivity of conversational network partners, using data from Kenya (Note 1).

The other papers in the volume have a substantive focus and address both standard demographic issues as well as some that are unusual.

- *Claire Noel examines whether women's concern about their risk of infection with HIV in the 1998 MDICP survey is associated with their subsequent fertility, specifically the likelihood that they bore, or avoided bearing, a child by 2001, and examines the determinants of the intersurvey fertility.
- * Georges Reniers uses marital histories collected in the 2001 MDICP survey to calculate the probability that a first marriage will end in divorce and examines the factors associated with the likelihood of divorce.
- *Michael Bracher, Gigi Santow and Susan Watkins use sexual partnership and marriage histories collected in the 2001 MDICP survey as input parameters for a microsimulation that estimates the proportion of brides and grooms infected with HIV at first marriage.
- *Amy Kaler examines local interpretations of masculine sexuality, using observational field journals written by local interviewers between 1999 and 2002 in Malawi.
- *Kirsten Smith describes the extent to which respondents in the 1998 MDICP survey were worried about becoming infected with HIV, and analyzes the factors associated with varying levels of concern.
- *Eliya Zulu and Gloria Chepngeno examine one strategy used by married men and women in Malawi to try to avoid infection with HIV: conversations in which they try to persuade each other to be faithful. They use survey data to examine factors associated with whether or not such conversations were reported and analyze qualitative data to describe the content of the conversations.
- *Christoph Bühler and Hans-Peter Kohler use KDICP survey data on the characteristics of respondents' social networks to examine another HIV prevention strategy, informal conversations about risk and approaches to prevention.
- *Alex Weinreb examines changes in network size and network diversity and the individual network and village characteristics associated with these changes, using data from the MDICP surveys.

4. Data

Authors describe the data sufficiently for the purposes of their papers. Here we provide more detail than it is feasible to present in the individual papers. The data are available for public use www.pop.upenn.edu/networks. Maps of each research site are in the Appendix.

We begin with the sampling for the household surveys and the qualitative data, since these are relevant for assessing the representativeness of our samples. We then turn to a discussion of data quality, emphasizing the threats to data quality that surprised us and are likely to be relevant for data collection in similar contexts.

The research team associated with the MDICP conducted preliminary qualitative work and questionnaire pre-testing between June and August 1997. A first survey wave (Malawi 1) followed between June and August 1998. Formal qualitative work was conducted between June and August 1999. The second wave (Malawi 2) of survey data collection was completed between June and August 2001. Two more waves of the MDICP are scheduled for March-May 2004 and June-August 2006; these rounds will include the collection of biomarkers. Qualitative reinterviews of the 1999 subsample are scheduled for June-August 2005 (Note 2).

The KDICP collected data on four occasions between 1994 and 2000. Preliminary qualitative work and questionnaire pre-testing was conducted in June-August 1994. A first survey wave (Kenya 1) occurred between December 1994 and January 1995. The second and third survey waves (Kenya 2, Kenya 3) followed between December 1996 and February 1997, and between January and February 2000, respectively. There are no plans to revisit the Kenya sites.

4.1. Malawi survey design

The MDICP is conducted in three distinctive districts of Malawi. Rumphi District, located in the northern region of the country, follows the patrilineal system of kinship and lineage where residence is ideally patrilocal, inheritance is traced through sons, and parents of a groom pay bridewealth. The northern district, inhabited primarily by Tumbukas, is predominantly Protestant. Balaka District, which is located in the southern region, follows a matrilineal system of kinship and lineage system where residence is ideally matrilocal, although it is not uncommon for wives to live at least some period of time in their husband's village. The South is primarily inhabited by Lomwes and Yaos and has the highest proportion of Moslems. Mchinji District, located in the central region, follows a less rigid matrilineal system whereby residence may be matrilocal or patrilocal (Zulu 1996). The Center is primarily inhabited by Chewas, with almost equal proportions of Catholics and Protestants.

The sampling strategy was not designed to be representative of the national population of rural Malawi. As Table 1 shows, however, our sample characteristics closely match the characteristics of the rural population of the 1996 Malawi Demographic and Health Survey (DHS). The target sample was 500 ever-married women age 15-49 in each district, plus their husbands. The sampling strategy adopted for the three districts differed in order to

permit comparison with earlier surveys. In Mchinji and Rumphi districts the sample was designed to cover Census Enumeration Areas (CEAs) included in the 1988 Traditional Methods of Child Spacing in Malawi (TMCSM) survey (Srivastava and M'manga, 1991). However, since the TMCSM sampled women regardless of their marital status, the CEAs included in the TMCSM survey had fewer ever-married women than the MDICP target sample of 500 women in each district. Three neighboring CEAs covered by the 1988 survey were thus added to the Malawi 1 sample. In each district a cluster sampling strategy was used in all villages in the selected CEAs. Household lists of those normally resident in those villages were compiled during the week prior to fieldwork, and a sample of eligible women was then randomly selected. Since villages varied in size, sampling fractions were inversely proportional to village populations, such that a higher proportion of eligible women in the smaller villages was sampled.

Table 1: *Comparison between 1995 KDICP and the 1993 Kenya Demographic and Health Survey (KDHS), and between 1998 MDICP and 1996 Malawi Demographic and Health Survey (MDHS)*

	Rural Nyanza(% currently married women 15-49)		Rural Malawi(% ever-married women 15-49)	
	1995 KDICP	1993 KDHS	1998 MDICP	1996 MDHS
Age				
15-19	10.5	8.4	8.4	10.3
20-24	25.3	20.2	22.3	21.2
25-29	20.1	19.8	21.8	16.5
30-34	19.0	21.8	15.1	16.0
35-39	12.2	11.4	15.4	12.2
40-44	8.7	11.8	9.7	14.5
45-49	4.2	6.9	7.2	9.2
Education				
None	18.9	22.9	33.5	48.1
Primary	67.5	62.5	60.8	50.4
Secondary or higher	13.6	14.6	5.7	1.5
Number of surviving children				
0	10.6	8.6	3.8	12.5
1	15.9	12.6	21.6	18.5
2	15.0	12.8	18.2	17.4
3	14.3	13.2	15.4	14.5
4	13.9	13.3	13.0	12.6
5	10.4	14.6	11.3	7.8
6	9.3	9.2	7.5	7.7
7+	10.7	15.6	9.2	9.0
Owns a radio	50.8	51.2	57.4	43.1
Ever used contraception	23.1	43.8	32.0	38.2
Currently using contraception	12.3	23.34	22.5	16.4
Sample size	899	787	1478	1123

Balaka district (formerly part of Machinga district) was chosen instead of the district covered by the TMCSM in the southern region of Malawi (Chiradzulu District) in order to examine the impact of a Community Based Distribution (CBD) initiative in the area, following a baseline survey conducted by the German aid agency GTZ with 1098 women and men in 1993. After taking into account the high rate of population growth in Malawi – roughly 3% per year – it was estimated that a 1 in 4 sampling procedure needed to be administered in only 9 of the 18 original GTZ villages in order to yield the target sample of 500 women. Consequently, we randomly selected 4/7 of the CBD villages and 5/11 of the non-CBD villages. A random 1 in 4 sample of women of reproductive age (15-49) and their husbands was then drawn. The sample was expected to yield about 90 women who were also interviewed by GTZ and about 75 men. To increase the number of GTZ respondents, we used a list of respondent names taken from the GTZ questionnaires to add 260 women and 125 men, divided equally between the CBD and non-CBD areas.

Malawi 1 interviewed 1541 ever-married women of childbearing age and 1198 men (of which 1065 were husbands of the currently married women) (Note 3). Malawi 2 re-interviewed the same respondents (excluding those who died between the two visits and women who had reached an age over 49) and also interviewed any new spouses: 1587 women and 1097 men were interviewed, including 186 new wives and 28 new husbands. There are three reasons for the larger number of women than men. One is that some ever-married women were not currently married. Second is polygamy: 329 women in Malawi 1 reported being in polygamous marriages. These polygamous marriages account for 70% of the difference between numbers of female and male respondents. Third, there is a great deal of temporary mobility, particularly by men, either for work or visiting. Only 1209 women and 823 men were interviewed both in Malawi 1 and Malawi 2. (The reasons for attrition, the characteristics of those interviewed only once, and the implications of attrition for analysis are discussed in Bignami-Van Assche, Reniers and Weinreb, this volume). Between Malawi 1 and Malawi 2, 11.6 % of male respondents and 13.2% of female respondents died; verbal autopsies were conducted by Henry Doctor (Weinreb and Doctor forthcoming). Refusal rates were very low; for example, in Malawi 2, 1.8% for men and 0.8% for women.

4.2. Malawi qualitative data

The MDICP conducted three qualitative projects to provide information that cannot be collected in a short-answer survey or to explore new topics. The three projects are: 1) Semi-structured interviews in 1999 with a random sample of MDICP respondents, primarily on conversations on family planning and AIDS between spouses and within social networks; 2) Observational field journals on conversations about AIDS kept by local

interviewers; 3) Small sets of ad hoc interviews to explore selected topics, including religion, sexually transmitted infections other than HIV, discordant couple's responses on the use of family planning, and the reliability of male reports of extra-marital partners. In addition, several qualitative projects were associated with the MDICP: Agnes Chimbiri on gender and reproductive health; Angela Chimwaza on home-based care of people with AIDS; Amy Kaler on the elderly's perceptions of change; Linda Tawfik on sexual partnerships; and Mike Mtika on intergenerational transfers.

Of the three MDICP qualitative projects, only the 1999 study used a randomly selected sample. Eligible respondents were selected from the 1998 MDICP survey. The sample size was determined by estimating the sample size that would be sufficient to provide variation across respondents that was similar to the variation in Malawi 1, guided by the distribution of relevant responses to attitudinal questions about family planning in the survey. Taking into account the pronounced differences in responses in Malawi 1 by region, we estimated that we would need a sample of at least 20 wives and 20 husbands in each of the three regions. Based on the non-response experience of the 1998 survey, we selected a large enough sample to end up with around 25 male and 25 female interviews in each region. In the South, we selected 38 women and 41 husbands, of whom 23 and 28, respectively, were interviewed. In the Center our sample of 37 women and 37 men was drawn from a list of 53 couples (15% of 350 couples), of whom we interviewed 26 women and 27 men. In the North, the sample consisted of 41 men and 41 women, of whom we interviewed 27 women and 25 men. At least three visits were made to locate respondents; most of those not interviewed were away from home, and only a few had died since Malawi 1.

The interviewers were the best of those who had participated in the Malawi 1 survey. In order to encourage the interviewers to shift from the structured approach of the survey to a more conversational approach in these interviews, they were given a simple interview guide that listed the four major areas to be covered in the interviews (family size, family planning, HIV/AIDS, and social network partners), with a small set of specific questions in each area. The interviews were conducted in the mother-tongue of the respondent, and usually transcribed and translated by the interviewer. An *a priori* coding scheme was developed by Watkins and Zulu, and the interviews were coded for analysis by Chepngeno.

4.3. Kenya survey design

All rounds of the KDICP were carried out in four sites in Nyanza Province, in south-west Kenya: Kawadghone, Owich, Wakula South and Obisa (Note 4). The four sublocations (Note 5) were chosen according to a 2x2 research design that maximized variation according to two characteristics: the spatial extension of social networks and the presence

(or absence) of a Community Based Distribution (CBD) program. The sublocations were chosen to be as similar as possible in every other characteristic; the selection was guided by our colleague Alan Ferguson of GTZ/Ministry of Health, who had long experience in Nyanza. The sublocations were not selected to be representative of the rural population of Nyanza; however, we show in Table 1 (above) that the characteristics of the Kenya 1 sample closely match the rural Nyanza sample of the 1998 Kenya Demographic and Health Survey (Reynar 2000).

Kenya 1 used a standard cluster sampling strategy, with clusters defined as villages. Villages were selected based on either a simple or stratified random sample in each sublocation. Lists of adults for each village were created with help from the *miji kumis* (village elders) (Note 6). Within each village, all ever-married women of reproductive age and, where currently married, their husbands, were interviewed. In Obisa, the final sample included 13 out of the 18 villages in the sublocation; in Kawadghone, 11 out of the 16 villages in the sublocation; in Owich, 10 out of the 21 villages in the sublocation (half from the lake, half from the hills). In Wakula South, there were only 5 villages, and all were included. In three villages in Obisa and in two villages in Owich men were oversampled.

Kenya 1 interviewed 925 ever-married women of childbearing age and 859 men (of whom 672 were husbands of the currently married women (Note 7)). Because there is a great deal of temporary mobility only 629 women and 544 men were interviewed in all three rounds. The reasons for attrition, the characteristics of those interviewed only once, and the implications of attrition for analysis are discussed in Alderman et al. (2001). The collection of verbal autopsies on those respondents who had died was supervised by Weinreb and Watkins (Weinreb and Doctor forthcoming).

4.4. Kenya qualitative data

In June and July of 1994 we interviewed 10 men and 10 women in each of our four sites, and conducted at least two focus groups in each site.

Semi-structured interviews: There was no list of inhabitants to use for selecting couples to interview; thus, we developed alternative procedures. Because social networks were a focus of the study, we attempted to ensure that respondents would on average be roughly equidistant from places of more intense social interaction, i.e. the village center and the road (if there was one). We began at the center of the sublocation, and counted a predetermined number of dwellings in a pre-determined direction, interviewed, and then set off in a different direction. If there was no eligible couple living in the household or if the eligible couple was away and not expected to return during the team's stay in the site, we went to the next house. Eligible respondents rarely refused an interview, but one or both members of a couple were often away. This probably led to some under-selection of the

busy and socially active. Interviews were conducted in Luo and taped. Shortly after the interview, the interviewer simultaneously transcribed and translated the interview, which was then immediately typed. Five interviews were transcribed and translated by someone not connected with the project. Although there were occasional differences in wording, the translations were very close. An a priori coding scheme was developed by Rutenberg and Watkins, who then coded the interviews.

Focus Groups: We conducted two focus groups in each site, plus a focus group of CBD workers in Obisa and an (attempted) focus group of those who disapproved of family planning in Wakula South. Our most serious mistake—and a first indication of the influence of context on data quality, discussed below-- was in the procedure for selecting the focus group respondents. The study director, Charles Onoka, asked the chief or subchief, (in person as well as in a follow-up letter) to collect all eligible women on the first day the team would be in the site; eligible women were defined as married women, with no more than a primary education, ages 20-40. Our intention was to select randomly from these women. Instead, the chief/subchief called only a small number of women. A rough comparison of the women who came to the focus groups with those chosen systematically for the qualitative interviews, suggests that the chiefs selected their most “presentable” women--they often had more than a primary education and were users of family planning--and, as befits a chief’s role as patron, their relatives. Thus, the attitudes expressed in the focus group about family planning are likely to be disproportionately favorable. The focus groups were taped and simultaneously transcribed and translated by the moderator and note-taker, and immediately typed. Again, an a priori coding scheme was developed by Watkins and Rutenberg, who coded the data.

In addition to the semi-structured interviews and focus groups conducted for the KDICP, Nancy Luke conducted interviews in the KDICP sites on women’s reproductive health (Luke 2000), Kevin White measured the geographic distance among network partners (White 2000), and Watkins supervised the ad hoc collection of qualitative data to clarify issues that arose after analysis of the first round of survey data.

5. Data quality

Most of the authors of the papers in this volume participated in data collection, and at least one of the PI’s was in the field throughout data collection. Such widespread and intensive participation by those who analyze the data appears to be unusual, but we have concluded that it is valuable. All of the authors are aware of potential problems with their data arising from the data collection, and were thus able to adjust their analyses and interpretations accordingly.

Our field experience exposed contrasts between ideal-type surveys as they are described in the literature and the actual process of data collection. Notably, there were unexpected threats to data quality. Although we have come to conclude that these threats are likely to be common to data collection in similar contexts, they were unexpected because there is little published about aspects of data collection that may influence the analysis and interpretation of the data. The space limitations of most journals make it difficult to pay much attention to data quality. Our experience, however, suggests the need for critical evaluations of data quality in published articles, and particular attentiveness to context-specific threats to data quality. We thus take advantage here of the more flexible space limitations of an electronic journal to describe what we learned about threats to data in the hope that this will be useful to others embarking on data collection in similar contexts as well as to readers of the papers in this volume as well as those published by others.

When the first large-scale demographic surveys were conducted in developing countries in the 1950s and 1960s, there was considerable concern about the quality of data; discussions of data quality sometimes appeared in journal articles as well as in research reports. Surprisingly little attention is now given to data quality (for notable exceptions in the AIDS literature, see Gregson et al 1996; Pool et al 1996; Huygens et al 1996; Buvé et al 2001). In recent demographic research, it appears that acknowledging that aspects of the data are less than ideal is considered akin to acknowledging scientific malpractice. The close correspondence of our data with the widely respected Demographic and Health Survey (DHS) data show that issues we identified as problematic are likely to be similarly problematic in other research sites in sub-Saharan Africa--and some may occur in developed countries as well (e.g. Tanur 1992; Maynard et al 2002).

Much of the literature on survey methodology gives the impression that data quality can be assured if the questionnaire or interview guide is well-designed, if interviewers are well-trained and the questionnaires carefully checked for interviewer errors. We have come to conclude, however, that these guidelines are not sufficient to ensure uniform high-quality data in our research sites.

Questionnaires: The same basic survey questionnaire was used in all five rounds of the Malawi and Kenya projects, although questions were dropped if they proved to be extraneous to our analyses or too difficult for respondents to answer, and added as new interests developed. The questionnaire was least well-developed in Kenya 1, but since each round served as a large pretest for the subsequent round, successive refinement of the questionnaire meant that there was less and less ambiguity in the questions. Nonetheless, as Enid Schatz's paper in this volume shows, there are inevitable difficulties when respondents are asked to give (and interviewers to code) short answers to what may be situationally complex questions, or when respondents simply wish to lie, as with reports of extramarital partners.

Interviewers: Interviewers are obviously critical for data quality, as they are the points of connection between the goals of the research team and the respondents. Our interviewers were Form 4 (secondary school) graduates, chosen on the basis of an aptitude test and an individual interview. Interviewers were local, i.e. they grew up in the area, although some were not living there at the time but returned for the opportunity to earn money. Teams of 25-30 interviewers were selected in each site on the basis of an aptitude test; in Malawi, we added a language test after we found that some interviewers who claimed to speak the local language did not. Approximately 200 applicants took the aptitude test in each site, a sign of the underemployment of high school graduates.

To evaluate whether our use of local high school graduates as interviewers was problematic, we calculated interviewer effects for our data and for the DHS (the latter also uses high school graduates, but they are not chosen locally); the interviewer effects are quite similar (Bignami-Van Assche et al, this volume). We also found, somewhat surprisingly, that the duration of training had little impact on the magnitude of interviewer effects. Initially (in Kenya 1), training was for three days; by Kenya 3 it was six days, and remained that length in the MDICP. The interviewer effects, however, did not differ notably across rounds or projects.

The literature on interviewing in developing countries suggests that when questions are sensitive it is desirable to use same-gender interviewers who are outsiders to the community; respondents are assumed to be more open with interviewers who are of the same gender but strangers. Our goal was that the proportion of male and female interviewers be roughly equivalent to the proportion of male and female respondents. However, most of those who appeared for the aptitude test were male, and because females typically have less education, men were more likely to do better on the aptitude test. We thus had more male than female interviewers. In addition, for logistical and budgetary reasons we permitted cross-gender interviewing in circumstances when a mixed pair of interviewers found only women present in the household. We also expected that some of the interviewers would be acquainted either with the respondent or the respondent's family. Weinreb (2000b) evaluated responses in cases where the interviewer knew the family of the respondent and cases where he/she did not, by gender. He found that on some sensitive questions responses appeared to be more truthful when the interviewer knew the respondent's family and when interviewer and respondent were the same gender, but in other cases the outcome was the opposite (see also Lagarde, Enel and Pison 1995). Initially the decision to use local interviewers, rather than outsider interviewers as does the DHS, was made for budgetary reason (no accommodation costs or per diems). Our comparison of interviewer effects with those of the DHS suggests that this does not affect the magnitude of interviewer effects. But we also came to believe that local high school graduates are preferable to more educated and urban interviewers, for a number of reasons: 1) Local interviewers facilitated cooperation from survey respondents, who perceived the salaries

as a benefit of the project to the communities--and complained vociferously if an outstanding applicant from outside their area was hired or if we hired someone such as a schoolteacher who already had a regular source of income. 2) Local interviewers make it possible to ensure that interviewers and respondents have the same mother-tongue, which is likely to be especially important for sensitive questions (Lucas and Ware 1977; Hanks 1999). This was not an issue in Kenya, where the same language is spoken in all four sites, but it was in Malawi, where the dominant mother tongue differs across the three regions, with smaller mother-tongue groups as well. We were surprised to find that speaking the mother-tongue of the respondent is not a criterion for the selection of interviewers in many surveys conducted in Malawi. 3) Local interviewers reduced the social distance between interviewer and respondent, which may be important in developing rapport (Bourdieu 1996; Huygens et al 1996). This is likely to be especially important if the outside interviewers are more educated, since in our contexts, the more educated are likely to insist on the social distance between them and less educated rural respondents (Rutenberg and Watkins 1997). 4) Local interviewers were often very helpful in modifying the questionnaire or interpreting responses; in contrast, our urban supervisors, despite their presumed cultural competence, on some issues were nearly as ignorant about local perceptions as we were. 5) Because the local interviewers so rarely had an opportunity to do something other than farm and to earn a substantial amount of money, their enthusiasm for work was very high, such that we had almost no problem with interviewers simply filling in the questionnaire without interviewing.

Our observation of interviews showed that despite emphasis in training on the importance of the exact questionnaire language, interviewers often did not follow these instructions. It is likely that interviewers are uncomfortable--and recognize that respondents will be uncomfortable-- with this highly task-specific form of interaction in a context where most social interaction is not task-specific, and thus use their own judgement. Reassuringly, recent work in survey methodology in developed countries suggests that standardization (rigidly sticking to the questions as written) is important but may not be either attainable or optimal for accuracy (e.g. van der Zouwen 2002; Shober and Conrad 1997; Dijkstra 1987; for developing countries, see Casley and Lury 1981).

Deviations from the questionnaire should affect the magnitude of interviewer effects; the similarity of interviewer effects in our data and that of the DHS described previously suggests DHS interviewers also adapt to prevailing conventions of conversations. More direct evidence of interviewer autonomy comes from a study of informed consent in Mali conducted by the DHS (Yoder and Konaté 2002). The language of the informed consent statement was given a great deal of attention, and interviewers were instructed to read the statement exactly as written. Nonetheless, in a majority of cases the interviewers explained rather than read the informed consent statement, and 24/192 introductions did neither (Yoder and Konaté 2002:19).

Checking: In addition to attempting to minimize interviewer error by careful construction of the questionnaire and by interviewer training, there were layers of checking. Checking was done first by the supervisors and then on the next day by a PI and graduate student members of the field team. This permitted us to detect possible interviewer errors when we were still in the survey site such that interviewers could return to respondents if there were missing data or if there were apparent interviewer errors. Data were entered in the field, which exposed a few further errors. Double entry of a portion of the questionnaires showed very low data entry error, e.g. under 1% of the responses in Malawi 2. Questionnaires are stored at the University of Pennsylvania, which permits further checking of odd responses.

Threats to data quality: Patron-client relations, and respondent autonomy: Although a well-designed questionnaire, well-trained interviewers, and layers of checking surely improve data quality, they do not ensure the validity and reliability of survey responses. In particular, we have concluded that several aspects of the context in which our data were collected have implications for data quality. One is the long-standing pattern of patron-client relations in these communities. Patrons such as chiefs and headmen attempted to direct the data collection process to bring material benefits to themselves and/or their clients. Second is that fieldworkers (supervisors and interviewers) as well as respondents have a great deal of autonomy, which they attempt to exercise in ways that will benefit themselves. The strategic exercise of agency by chiefs, headmen, fieldworkers and respondents is surely not particular to our research sites, but may have a greater impact on data quality when there is an evident contrast between a relatively resource-rich research team and a poor community.

The relative wealth of the research team was evident. All of the sites largely depend on subsistence agriculture, supplemented by earnings from cash crops, fishing, wage labor (either locally or through male labor migration to urban areas) and small businesses such as buying bananas or soap at a larger market and reselling them locally. Roads are poor, vehicles infrequently pass through the villages, and electricity and telephones are rare. In contrast, the research team displayed wealth: two vehicles, computers (and, where necessary, a solar panel or a generator), team members who came from the city or overseas. Although the team emphasized that it was engaged in university research rather than development, it was impossible to disabuse members of the communities of the presumption that the team represented the government and/or wealthy donors and that development initiatives, such as building a hospital or a road, were possible outcomes.

There were many indications of attempts by locals to embed the relatively resource-rich projects in local patronage networks. For example, interviewer selection was often contentious, as chiefs and village elders tried to influence the selection of their clients, usually relatives or clan members, as interviewers. Although typically we were able to counter their attempts by referring to meritocratic selection—an ideal if not always an

actuality in local schools--and by displaying their favorites' aptitude test scores, this was not always successful: in one Kenya site, refusal to hire the children of two elders who were counting on the money for school fees led to the refusal of a large portion of the respondents from their village to agree to be interviewed, a threat that only disappeared when we threatened to abandon the site, thus removing jobs not only of interviewers but of cooks and providers of water and firewood.

Firing interviewers and supervisors who proved to be incompetent was, if anything, more difficult than hiring them. Supervisors appeared to understand our emphasis on the importance of interviewers for data quality. But this was an abstract appreciation (since they were not going to analyze the data), and familiar patterns of patron-client governance pulled supervisors in another direction. They quickly came to see themselves as patrons of their interviewers, with a responsibility to protect their clients' positions; in addition, since they also perceived the project as wealthy, they favored as much income distribution from foreigners to locals as possible. Similarly, a group identity quickly developed among the supervisors themselves, who resisted firing one of their members (see, also Lockwood 1992).

The survey literature, as well as the absence of attention to data quality in most published research on the demography of developing countries, led us to expect that respondents would be "cooperative communicators". This was not invariably the case. Just as researchers attempt to control the survey interaction for their own benefit, for example through the selection and order of questions on the questionnaire, so also do respondents attempt to control the interaction (see also, Salamone 1977). In both Kenya and Malawi, many respondents appeared to expect rewards for their participation in research. The strategic exercise of agency by respondents is rarely mentioned in research articles, although it does appear in articles on field work experiences (Francis 1992, Johnson 2001 and Jensen 1989 for Kenya; Salzman 1999; Huygens, et al 1996 for Uganda; Bleek 1979 and Devereux 1992 for Ghana). A comparison of field work experiences in a collection of articles on African and Asian countries (Deveraux and Hoddinott 1992) suggest that expectations of benefit are more common in Africa. In other studies with different aims or in different places, other aspects of the context may be more important. For example, Philip Setel, an anthropologist studying AIDS in Tanzania, found that those with whom he interacted refused to believe that his goal in asking questions about sex was research to help combat AIDS rather than his own seeking of sexual partners: "the combination of my youth, money, mobility and my apparent surfeit of free time added up to a recipe for unrestrained desire" under the guise of helping to combat AIDS (Setel n.d.:5). In their study in China, Smith et al. (1997) found that it was the administrative context that most influenced the quality of the data.

The most striking examples of respondent autonomy from our projects is a study of inconsistencies in reporting. While checking questionnaires in Kenya 1, we were surprised

to find that monogamously married husbands and wives differed in the reporting of household possessions such as a pit latrine and a mattress. After sending interviewers back to check, we found that these discrepancies did not appear to be due to interviewer error. Miller, Zulu and Watkins (2001) systematically compared responses of monogamously married spouses on Malawi 1 questions that they were expected to answer identically, such as the possession of household goods and whether they currently use family planning or have discussed AIDS with their spouse. There were discrepancies in reports for about 10% of the couples on household items and about 30% on the family planning and AIDS questions. There is some room for ambiguity even in these questions: for example, in a patrilocal area such as Nyanza, the husband may perceive as his the pit latrine in the compound in which he lived as a child, whereas the in-marrying wife may not, and there may be differences in what counts as a “discussion of AIDS.” If these discrepancies were due to interviewer error, ambiguities in the questions or uncertainties in the respondents, they could be dismissed as “noise”. Miller et al, however, found that discrepant responses were systematic with respect to gender. When husbands and wives disagree, it is typically the husband who says yes and the wife who says no. The authors concluded that men and women have different strategies for interaction with the survey, with men likely to present themselves as good providers who are aware of government and donor efforts to promote family planning and AIDS prevention and who, as good providers, deserve to be rewarded, whereas women appear to prefer to present themselves as needy. Interestingly, there were interactions between region and gender: responses to AIDS questions in the North were less influenced by gender than those in the Center and South. Miller et al found the same systematic patterns of husband-wife discrepancies in the Kenya DHS and the Malawi DHS, evidence that these patterns are not particular to our surveys (see also Becker 1999 for Zambia and the Dominican Republic; Ratcliffe et al 2000; Ezeh and Mboup 1997; Becker et al. 1995).

To evaluate whether the discrepancies between husbands and wives were due to the structured format of the household survey, we identified among respondents of the 1999 semi-structured interviews a small number of couples who in the 1998 household survey had disagreed about their current contraceptive use. Although the qualitative interviews were tape-recorded, an element of formality, there is presumably greater rapport and openness in semi-structured interviews. Nonetheless, qualitative interviewing is not a panacea: husbands and wives again not only differed from each other, but also gave responses that were inconsistent with their 1998 survey reports.

Initially we tried to correct discrepant responses between husbands and wives as well as inconsistencies within individual questionnaires. Inconsistencies, or lies, may alert analysts to “the different moral universes” of the researcher and the informants (Geertz 2000:30; see also Lockwood 1998; Jackson 1998; Huygens et al 1996; Sen 1994; for the usefulness of respondents’ lies, see Castle 2001, Cassel 1991 and Salamone 1977). Thus,

when inconsistencies were discovered during questionnaire-checking, after attempting to assure ourselves that the inconsistencies were not due to interviewer error we left them in the data. This permits analysts to ask what we believe is an important question: what can systematic inconsistencies tell us about features of the context that may affect data quality?

Respondent autonomy may be particularly relevant for AIDS research. Although researchers ask about sexual behavior and the use of condoms, we were naïve to expect that respondents approached by an interviewer with a clipboard-- and a lengthy introduction asking for informed consent-- will invariably choose to be truthful. In 1999, we conducted a small set of interviews with men in order to evaluate the validity of reporting on extramarital sexual activities in the 1998 MDIC survey. In 1998, we had asked whether the respondent had an extra marital partner in the past 12 months. 9.2% of men and 2.3% of women said they had. In 1999, in two of the three regions, the South and the Center, we re-interviewed some men under 30 who had reported on the 1998 survey that they had had no extramarital partners in the previous 12 months. We emphasized to the interviewers (all male) that these interviews were to be very informal (no questionnaire and clip-board, no tape recorder) and casual, such that the men would forget that the interviewers were part of our project, and that the interactions would be as much like the casual conversations about sex that we believed occurred (given the notable presence of the research team in the field, however, it is unlikely that all of the respondents made this distinction). We asked the interviewers to try to find out about extramarital partners for the 12 months before the 1998 survey, but because the interviews were so informal it is unlikely that the reference period was precise—and the respondent's recollection may not have been precise on the survey, despite the precision on the questionnaire. At the end of the work-day, the interviewers recalled the conversation to the PI, who typed as they spoke.

We found that more men acknowledged extramarital relations in the 1999 interviews than in the 1998 household survey: about half of the respondents in the South and about a third of those in the Center who had reported no affairs in 1998 said in 1999 that they had had them (Note 8). The comparison across the two types of interview settings does not permit an estimation of the level of extramarital activity. Because the interviewers of the “mobile men” did not make strenuous attempts to find respondents, the sample may be biased towards those who were more stable, i.e. more likely to be around; the reference period was less precise in the informal interviews, which may contribute to the higher reports; and in informal conversations men may exaggerate their sexual activity, as Amy Kaler discusses in her paper in this volume. The comparison is enough, however, to raise questions about the validity of the reporting of sexual behavior. And, since it is reasonable to believe that extramarital relations are more likely to be reported in informal settings than in the structured context of a household survey, we conclude that men's extramarital sex is under-reported on our surveys, and probably those of others as well.

When researchers have attempted to evaluate the reporting of sexual behavior, it is clear that misreporting may be systematic; for example, under-reporting of sexual partners appears to be greater for women than for men, whereas men may over-report condom use (Buvé et al 2001) (Note 9). A summary of 14 studies conducted by WHO concluded that the higher reports of sexual activity by men than women was probably due to women's "conscious under-reporting" rather than memory lapse (Caraël, et al 1994; see also Cohen and Trussell 1996, Orubuloye et al 1992). Even more problematic is that reporting may vary by the level of the epidemic or interventions to change behavior: "It is also possible that respondents' perceptions of acceptable and desirable answers to standardized questions have changed over the study period as societal norms have adjusted to the realities of the era of the AIDS epidemic" (Kamali et al 2000:433).

6. Conclusion

In conclusion, we have come to believe that there are unavoidable context-specific threats to data quality in research on AIDS in rural Africa. In our research in rural Kenya and Malawi, careful questionnaire construction, selection and training of interviewers and layers of checking for interviewer error were not sufficient to ensure validity. Rather, we find evidence of the importance of patron-client relations, respondent autonomy and interviewer autonomy, all of which may affect data quality. We also noted indications of similar threats to data quality in data collected elsewhere by others, including the Demographic and Health Surveys, suggesting that some threats to data quality are general. That data are often not ideal is not new; what is important is that those who analyze the data know, as do the authors of the papers in this volume, where the data are likely to be reliable and where the data must be analyzed and interpreted cautiously.

Are there solutions? Some threats, such as incompetent interviewers, are likely to be evident to those given the responsibility for data collection, such as project field directors and supervisors. These personnel, however, are unlikely to be frank about problems, either to protect their own jobs and reputations or to protect their clients, the interviewers. One solution is for the researchers who will analyze the data and thus care most about its quality to participate in data collection and take authority for hiring and firing, thus removing these processes from the local patronage systems. Researchers faced with the consequences of respondent autonomy for reporting of sexual behavior can develop and employ measures of sexual behavior that depend less on self-reports of sexual behavior, such as biomarkers, or experiment with more anonymous techniques, such as computer-assisted interviewing. In yet other circumstances, analysts may be limited to after-the-fact remedies, adapting their analyses and interpretation to evidence of misreporting, as do the authors of the papers in this volume.

Ultimately, however, both respondents and interviewers have considerable autonomy that they are able to exercise for their own ends. This is likely to be particularly problematic when there are evident discrepancies in wealth between the research team and the communities under study. Some problems can be circumvented by improvements in the research process: others are likely to be persistent. Finally, we recommend that researchers not only attempt to uncover systematic biases in the data but also that a description of data collection procedures and an evaluation of data quality become a routine expectation for research articles. For reviewers and readers, their absence should be a cause for concern.

Notes

1. This paper was not presented at the conference.
2. In 1999, approximately half of the Malawi 1 sample population was surveyed by an affiliated project on intergenerational transfers (Weinreb 1998, 2000a, 2001, 2002; Mtika and Doctor 2001), but we do not discuss this survey here.
3. The other men were an over-sample drawn from one site for consistency with the previous GTZ survey.
4. When the KDICP began, all four sites lay within a single administrative district called South Nyanza District. Shortly before the second wave, this was divided into three new districts: Homa Bay, Karachuonyo, and Suba.
5. The sublocations vary in size. It takes about two hours to walk from one end of a sublocation to another.
6. The survey team found that these lists excluded few *de facto* residents of the village, because the village elders were likely to list the *de jure* residents of the village (including those who were away on a short- or long-term basis) and to omit women who headed their own households (Watkins et al. 1995).
7. The other men were an oversample drawn from five villages where most of the female respondents' husbands were away at the time of data collection.
8. A comparison of women's responses on sexual behavior from the 1998 MDICP with their responses in subsequent semi-structured interviews also found discrepancies (Tawfik 2003).
9. Studies that include biomarkers are particularly useful for evaluating the validity of self-reports of sexual behavior. A study conducted in four African cities that compared self-reports of sexual behavior with biological data on sexually transmitted infections (STIs) and HIV found that self-reported sexual behavior (e.g. contact with commercial sex partners, lifetime number of sex partners, rate of acquisition of new partners, lack of condom use and frequency of concurrent partners) did not distinguish between the two high prevalence cities and the two low prevalence cities (Caraël and Holmes 1994). Particularly striking findings from this project were that of those who reported no sex at all, at least 1-9% of men and 6-18% of women tested positive for a STI (see also Biddlecom and de Rose 1993 on virgin births). A study by Pool et al (1996) in Tanzania evaluated interventions using survey data, qualitative in-depth studies with men and a small number of their wives, and data on STIs and seroconversion; they note that there were inconsistencies across the three types of data.

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