METHODOLOGY FOR AN INTEGRATED HEALTH INTERVIEW AND EXAMINATION SURVEY IN EGYPT

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INTRODUCTION

In July 1977, the Ministry of Health (MOH), Arab Republic of Egypt, and the National Center for Health Statistics entered into an agreement to undertake a research project called the Health Profile of Egypt (HPE). The HPE is a seven-year project with the objective of establishing within the MOH a continuing, survey based, data collection system for health related information. The HPE consists of a series of health facility and manpower inventories, a health interview survey, and a health examination survey. In this paper, we will describe some of the design and methodological features of the Health Interview Survey (HIS) and the Health Examination Survey (HES), and will illustrate how some of the data collected in the two surveys may be used to evaluate the accuracy of data obtained from different sources; i.e., the household interview, medical history, and laboratory analysis. This evaluation is possible because the HES is based on a subsample of HIS households, and the HES is conducted within a month to 6 weeks of the household interview.

SURVEY DESIGN

The HIS is based on a probability sample representative of the Civilian, noninstitutional population of Egyptian nationals residing in Egypt. A total sample of approximately 72,000 households was allocated to the 25 Governorates (equivalent to States) of Egypt proportional to their population. And a controlled selection technique was used to divide the total sample into 4 single year samples of 18,000 households. Cairo, which contains more than a fourth of the total population, was in the sample each year; Alexandria, the second largest city was in the sample during the first and third years, and each of the other Governorates were in the sample only one of the four years. The sample has a nice feature of being additive, so that national estimates can be derived from any combination of the 4 annual samples.

Within Governorates, the sample is further clustered. In large urban Governorates such as Cairo, the first stage sample was enumeration areas consisting of about 200 households each. In Governorates with large urban and rural populations, the Capital Markaz (county) was selected with certainty, and other Markazes were selected with probability proportional to size (PPS). Then within sample Markazes, enumeration areas or villages were selected, depending on whether the area was urban or rural. In rural Governorates the first stage units were villages.

Finally, within each of the first stage sampling units, a systematic sample of households was selected with a probability such that the overall probability for selecting a household, or a person was a constant 1 in 100.

This design requires that all interviews be completed in a Governorate before moving on to another Governorate. Thus, the workload for the survey is concentrated in a relatively small area of the country at any given time. Also, the time required to complete interviews in a Governorate varies with the size of the Governorate, since the size of the sample is proportional to the population of the area. The concentration of the population into relatively small geographic areas, even for rural areas, combined with features of the HIS, makes it possible to conduct the Health Examination Survey (HES) on a subsample of the HIS. Except for some urban-rural Governorates where it was necessary to subsample Markazes, the HES sample is a systematic 1 to 10 subsample of the HIS sample. The two samples are carefully linked so that if desired, all of the data collected in the HIS can be cross-tabulated with data collected in the HES.

TYPES OF DATA AND QUALITY CONTROL

The information collected in the HIS covers a variety of topics, ranging from items that are widely known and easy to report to items that are complex and difficult to measure. Included are such topics as city or village environmental health (presence of electricity in the home, street lights, source of water, method of waste disposal), housing environment (type of building material, whether water and toilet are indoors, number of rooms in house, type of flooring), uses and availability of health services, prevalence of chronic diseases, impairments, dental care, family planning, and nutrition.

There is no completely satisfactory way to measure, or to control the accuracy of the data reported in the interviews. The approaches used are those commonly employed in interview surveys. Before the survey was implemented nationally, it went through extensive methodological development and pretesting.

Before the survey is conducted in each Governorate, a new team of interviewers, who are chosen from male sanitarians and female health workers, go through a 5 day training session, including classroom instructions, and live interviews under the observation of full-time supervisors.

At the end of each day of interviewing the forms are collected and edited by the supervisor. Obvious errors are corrected, either from evidence on the form or by querying the household members. Supervisors routinely check each household after interviews are completed to be sure that the correct house was interviewed, and to check the accuracy of items that have been completed by observation such as type of sanitary facilities and structure in which sample families live. Errors found are discussed with interviewers in an attempt to minimize bias.

In addition to these quality checks, within a day or two after the original interviews, a random 2 1/2 percent sample of the households is reinterviewed by the supervisors.

EVALUATION METHODS

It is possible to evaluate the accuracy of some of the health interview data by comparing the interview reports with similar data collected in the Health Examination Survey. In the HES a few items are reasked that were obtained in the HIS, including marital status, education levels and occupation. Also, it is possible to compare health related conditions reported in the HIS with several sources

of data in the HES. For example, in the HIS, respondents 6 years of age and over are asked if they suffer from certain chronic conditions as specified on the questionnaire (diabetes, high blood pressure, heart problems, bilharziasis, etc.). In the HES, a medical history is taken by a physician covering present complaints and past history. A series of laboratory tests is made, and a general physical examination is given. To illustrate how the data collected in the HES can be used to evaluate the HIS reports, a case study is presented on bilharziasis, one of the most important health problems in Egypt.

As part of the physical examination, urine and stool specimens are obtained. Among a number of analyses done on the specimens is an analysis for bilharziasis. This involves the viewing of specimen smears under a microscope and searching for bilharzia ova. Usually the ova are very distinct and easy to recognize. Consequently, the test is quite accurate.

The analysis that follows is based on a sample of 349 persons selected from 9 enumeration areas (EA's) in Ismailia, one of the Governorates of Egypt. The results shown are illustrative only and do not respresent the levels of bias that would be found if the analysis were performed on the total HES/HIS sample.

EVALUATION OF BILHARZIASIS OBTAINED BY PERSONAL INTERVIEWS

Of the 349 people in the HIS/HES sample, 284 were over 6 years of age and were asked whether they had bilharziasis. Twelve persons, or 4.2% reported the condition. Of the 264 persons examined 28 or 10.6% were diagnosed as having the condition, based on the combined analysis of the urine and stool specimens (Table 1).

This is a large difference, and assuming that the HES data are accurate, estimates of bilharziasis from the interview data would be very misleading. The problem is even worse however, when the accuracy of the 12 positive reports is known. As shown in Table 1, only one person was found to have bilharziasis upon examination.

This finding raises a number of questions. Did the respondents understand the questions asked in the interview? If not, is the questionnaire at fault, or is it too much to expect that a population with an illiteracy rate of about 40 percent (based on this small sample) can accurately report bilharziasis? Some light can be shed on these questions by looking at the data on previous history as reported in HES.

In Table 2, it may be seen that 55 of the 347 persons who provided medical history information said they had bilharziasis at sometime during their life time.

Of the 55 positive reports, 10 were found to actually have bilharziasis. Of the 266 negative past history reports, 22 were diagnosed as having the condition. These figures provide some evidence that more people knew they had bilharziasis than indicated by the number of cases reported in the household interview. They also indicate that many people are unaware that they have bilharziasis. If this is true, the survey can point to the need for a public education campaign to make people more aware of the symptoms of the disease and the need for medical care.

DIAGNOSIS OF BILHARZIASIS IN THE HES

There are mainly two types of bilharziasis in Egypt, namely; urinary (shistosoma hemotabium) and intestinal (shistosoma mansoni). So to diagnose the disease it is necessary to conduct a laboratory analysis on both urine and feces. A person may have living ova in either his urine, his feces, or in both. For this small sample, slightly more people had ova in their feces than in their urine as shown in Tables 3 and 4. Only three people were found to have ova in both urine and feces. This double infestation is taken into consideration in determining the final diagnosis as shown in Table 5.

EVALUATION OF THE REPORTING OF OTHER HIS VARIABLES

As pointed out earlier, this integrated sample design for the two surveys makes it possible to evaluate the accuracy of some of the health interview data by comparing interview reports with similar data collected in the HES. In the HES, a number of data items are repeated, including age, sex, literacy status, occupation, marital status, number of live and still births, use of contraceptive pills, state of vaccination, personal habits such as brushing teeth, washing hands, bathing, drinking alcohol and smoking. For this case study, three variables have been selected for the evaluation, namely; marital status, occupation, and age. The comparisons are shown in Tables 6-8.

Marital Status Table 6 shows that there are minor differences in the reporting of marital status. The major difference is for the "married" category. In the HES, 5 people were classified as "below age" of marriage, who possibly were married. "Below age" includes all males under 18 and all females under 16. This indicates that some people are being improperly classified in HIS as "below age" when they should be classified as married.

Educational Level The reporting of educational level appears to be done very well. Table 7 shows an almost perfect match between the reports of the two surveys.

Occupation Again, the data show an amazing consistency for the two surveys (Table 8). For most of the differences observed, HIS classified the persons as unemployed while HES classified them according to their occupation when employed.

SUMMARY AND CONCLUSIONS

There are many distinct advantages to conducting a health examination survey and a health interview survey on the same sample. The feasibility of this approach has been demonstrated in Egypt, where a 10 percent subsample of households in the Health Interview Survey are examined by physicians and technicians within 4 to 6 weeks of the household interviews. A sample of about 20,000 persons is scheduled to be examined by the end of the survey in 1983.

One of the advantages of an integrated health survey is that there are opportunities to replicate some of the questions in the interview survey but more importantly, the examination survey provides objective information on health related variables that can be used to assess the accuracy of interview reports. In this paper a small case study on bilharziasis is presented which indicates that bilharziasis is very poorly reported in household interviews. Although we have not assessed the accuracy of the HES findings on bilharziasis, there is no reason to believe that the data are not relatively accurate.

Table 1. Frequency of Bilharziasis as Determined by Personal Interview and Physical Examination

	Personal Interview			
Physical Examination (HES Final Diagnosis)	Bilharziasis? yes	No	Question not asked - Person under 6 years of age.	Total
Bilharziasis?				
Yes	1	27	4	32
No	11	225	54	290
Not Examined	0	20	7	27
Total	12	272	65	349

Table 2. Frequency of Bilharziasis Based on Final Diagnosis by Physician and on Medical History

	Medical History				
HES Final Diagnosis	Urinary Ova	Intestinal Ova	Negative	NA	Total
Positive	9	1	22	0	32
Negative	42	3	244	1	290
Not Examined	0	0	26	1	27
Total	51	4	292	2	349

Table 3. Frequency of Bilharziasis Based on Urine Analysis

Results of Urine Analysis	Urban	Rural	Total
Living ova found	2	13	15
Living ova not found	151	152	303
Not Examined	21	10	31
Total	174	175	349

Table 4. Frequency of Bilharziasis Based on Stool Analysis

Results of Stool Analysis	Urban	Rural	Total
Living ova found	4	16	20
Living ova not found	135	144	279
Not Examined	35	15	50
Total	174	175	349

Table 5. Frequency of Bilharziasis Based on Final Diagnosis by a Physician

HES Final Diagnosis	Urban	Rural	Total
Positive	5	27	32
Negative	150	140	290
Not Examined	19	8	27
Total	174	175	349

Table 6. Distribution of the Sample by Marital Status as Reported in the HES and HIS

Marital Status HIS	Marital Status - HES					
	Single	Married	Divorced	Widow	Below* Age	Total
Single	67	0	0	0	1	68
Married	0	124	0	1	0	125
Divorced	0	1	3	0	0	4
Widow	0	0	0	9	0	9
Below Age*	0	5	0	0	138	143
Total	67	130	3	10	139	349

*Under 16 for females and under 18 for males.

Table 7. Distribution of the Sample by Educational Level as Reported in the HES and HIS

Educational Level-HIS	Educational Level - HES							
	Read & Write	Primary	Preparatory	Secondary	Univ.	Illiterate	Under 6 Years of Age	Total
Read & Write	65	1	0	0	0	0	1	67
Primary	0	22	0	0	0	0	0	22
Preparatory	0	0	25	1	0	0	0	26
Secondary	0	0	0	18	1	0	0	19
University	0	0	0	0	6	0	0	6
Illiterate	1	0	0	0	0	136	0	137
Under 6 Years of age	0	0	0	0	0	0	72	72
Total	66	23	25	19	7	136	73	349

Table 8. Distribution of the Sample by Occupation as Reported in the HES and HIS

Occupation-HIS	Occupation - HES									
	Scientific & Tech.	Administrative	Not working	Clerk	Salesmen	Social-workers	Agriculture	Laborers	Not ascertained	Total
Scientific & technical.....	3	0	0	0	0	0	0	0	0	3
Administrative.....	0	2	0	0	0	0	0	0	0	2
Not working.....	3	2	261	1	0	0	0	0	1	268
Clerks.....	0	0	2	7	0	0	0	0	0	9
Salesmen.....	0	0	0	0	4	0	0	0	0	4
Social workers.....	0	0	0	0	0	10	0	0	0	10
Agriculture work.....	0	0	0	0	0	0	27	0	0	27
Laborers.....	0	0	0	0	0	0	0	22	0	22
Not ascertained.....	0	0	0	0	0	0	0	0	4	4
Total.....	6	4	263	8	4	10	27	22	5	349