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Overview of Interview Rates and Reasons for Nonresponse in the Israeli Labor Force Survey, 1996-2000

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שיעורי היענות וסיבות אי-השבה בסקר כוח אדם: סקירת-על עבור התקופה 1996-2000

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תקציר

סקר כוח אדם (סכ"א) הוא המקור העיקרי לנתוני תעסוקה וכוח העבודה בישראל. הסקר נערך מידי רבע שנה ומשקי הבית מתבקשים להשתתף בארבעה ראיונות (המכונים גלים). בעבודה זו אנו סוקרים את תהליך עבודת השדה ואת הכלים המשמשים לאיסוף נתונים על לא-משיבים. אנו מציגים ניתוח תיאורי של דפוסי ההשבה ואת המגמות עבור התקופה 1996 ו- 2000. ממצאים עיקריים כוללים:

- בין השנים 1996 ו- 2000 שיעורי ההיענות ירדו באופן מתון: מ- 92.6% בשנת 1996 ל- 89.7% בשנת 2000. ירידה זו נצפית לאחר תקופה ארוכה של עליה בשיעורי ההיענות.
- הירידה בשיעורי ההיענות בשנים 1999 ו-2000 התרכזה בגלים בהם עיקר החקירה נערכת בטלפון, וזאת עם יישום טכנולוגיה חדשה של ראיון טלפוני תמוך מחשב בגלים אלה.
- בין השנים 1996 ו-1999, שיעורי ההיענות בגל הראשון, הנחקר בעיקרו בראיון פנים אל פנים, היו נמוכים מאלה שבגלים השני והשלישי, הנחקרים בעיקר בראיון טלפוני; השיעורים בגל הרביעי, הנחקר בעיקר בראיון פנים אל פנים, היו דומים לאלה שבגלים השני והשלישי.
- קשרים בין-גליים אלה השתנו בשנת 2000, ובמידה פחותה בשנת 1999, עם שיעורי היענות נמוכים יותר ושינויים בדפוסי ההשבה בגלים בהם יושמה מערכת הראיון הטלפוני תמוך המחשב.

בתקופה הקודמת ליישום הטכנולוגיה החדשה, הנתונים על סיבות אי-השבה מצביעים על שיעורי סירוב והיעדרות גבוהים בגל הראשון בהשוואה לגלים השני והשלישי. שיעורי אי-ההשבה הגבוהים יותר עשויים לנבוע מעומס גבוה יותר על הפוקדים בגל הראשון, או מהשהייה מסוימת בנכונות המשיבים להשיב לסקר. לאחר יישום טכנולוגית הראיון הטלפוני תמוך המחשב, הסיבות לעליה בשיעורי אי-ההשבה יותר קשות לניתוח, עם עליות גדולות בשכיחות קטגורית אי-ההשבה "אחר" ועליה בשיעורי הסירוב בשנת 2000.

אחד הקשיים שהתגלו במהלך העבודה הנוכחית הוא חוסר היכולת להבחין בין סיבות לאי-השבה. במיוחד, שיעור גבוה של משקי בית לא-משיבים סווגו כ"אחר", כולל אלה שלא נוצר אתם מגע טלפוני. אנו ממליצים כי בעתיד הנתונים יהיו ברמת פירוט גבוהה יותר.

מילות מפתח: אי-השבה; סקר פנלי; ראיון טלפוני תמוך מחשב; שייכות לא ידועה (נפס); ניתוח מדידות חוזרות

Overview of Interview Rates and Reasons for Nonresponse in the Israeli Labor Force Survey, 1996-2000

Abstract

The Israeli Labor Force Survey (LFS) is the primary source of employment and labor force statistics in Israel. The survey is conducted quarterly, with households asked to participate in four interviews (known as waves). In this paper, we review the field process and tools used in the LFS for data collection on nonrespondents. We then present a descriptive analysis of the response patterns and trends observed in the period 1996 to 2000. Key findings include:

- Between 1996 and 2000, interview rates declined modestly: from 92.6 percent in 1996 to 89.7 percent in 2000. This decline followed a relatively long period of increasing rates;
- The decrease in interview rates in 1999 and 2000 was concentrated in the waves that are typically conducted by telephone, coinciding with the implementation of the new Computer Assisted Telephone Interviewing (CATI) technology in those waves;
- Between 1996 and 1999, interview rates were lower in wave one, which is conducted primarily in-person, than in waves two and three, which are conducted primarily by phone; wave four, which is primarily in person, had rates that were closer to those of waves two and three.
- These cross-wave relationships changed in 2000 and to a lesser extent in 1999, with lower interview rates and apparently changed pattern of nonresponse in waves that implemented the new CATI system.

In the pre-CATI period, the data on reasons for nonresponse show higher rates of refusal and noncontact in wave one as compared with waves two and three. The higher rates of nonresponse may be the result of a greater burden on wave one interviewers, or simply a delayed willingness to participate. Following the implementation of CATI, the source of increased nonresponse are difficult to interpret, with very large increases in the broad category of nonresponse, "other", and increases in the refusal rates in the year 2000. One complication discovered in preparing this work was the difficulty in disentangling reasons for nonresponse. In particular, a large proportion of nonresponding households are classified as "other", including those that are not contacted over the telephone. We recommend that data that are more detailed be recorded in the future.

Keywords: Nonresponse; Panel study; CATI; Unknown eligibility; Repeated measures analysis

I. Introduction and Background on the Labor Force Survey[1]

In this paper, we present a review of the field process and tools used in the Israeli Labor Force Survey (LFS) for data collection on non-respondents. We then describe the response patterns and trends observed in data for all of Israel from 1996 through 2000.

The objective of this work is three-fold: First, to offer a systematic and comprehensive documentation of processes and available data, while pointing to inconsistencies, changes over time and differences between sources. Second, to suggest consistent and uniform definitions for interview, refusal and noncontact rates for all panels and waves. Finally, we aim to present an overall analysis of the response patterns over time, by wave and reason of nonresponse. We regard the present work as a first step in a much-needed study of nonresponse in one of the

[1] Sima Ophir, Ruhama Yitzhaki, and Tzipora Radian of the Survey Unit provided much of the detail on the conduct of the LFS.

Bureau's major surveys. We hope that this preliminary work will provide both survey managers and data users with useful information and insight into patterns of nonresponse.

Our findings indicate that interview rates show a modest downward trend during the study period, following a longer period of increasing rates. Separate analysis of the data by wave indicates that interview rates fell in 1999 and 2000 for the waves typically conducted by telephone – coinciding with the implementation of the new computer-based interviewing technology – and that interview rates in the first wave are significantly lower than in subsequent waves. The available data on reasons for nonresponse do not provide enough detail to understand these patterns. We recommend that data that is more detailed be made available.

We begin with an overview of the survey and the sampling procedure, followed by a more detailed description of survey procedures. Data sources and definitions are provided in Section II. Aggregate trends in interview rates and reasons for nonresponse are presented in Section III, followed by a description of patterns by wave in Section IV. Finally, a summary and discussion follow in Section V.

I.1 The Survey and the Sample [2]

The LFS is conducted quarterly, with households asked to participate in four waves. The four waves are spread over a year and a half, with households included in the sample for two quarters, excluded for two quarters, and then included for two additional quarters. The sample is designed so that in each quarter interviews are attempted in equal proportions for cases in their first, second, third, and fourth wave. Each quarterly sample is intended to be representative of the permanent population of Israel aged 15 and over.

The population includes potential immigrants and permanent residents living abroad for less than one year. Temporary residents and tourists are excluded from the population unless they have been living in Israel continuously for more than a year. Bedouin living outside of localities and persons living in most institutions (other than dormitories at the seven major universities, immigrant absorption centers, and a portion of sheltered housing for the elderly), are part of the population, but are not covered by the current sample.

All localities are divided into complementary sampling frames that together cover the country. For most localities, the sample is drawn from municipal tax records, provided to the Bureau through an outside contractor. The records are current as of March of the year of selection. In areas without usable municipal records, the frames for selecting the sample are obviously different. Sampled moshavim and villages are asked to provide listings of dwellings or households. Kibbutzim typically provide listings of persons rather than households, which are then used to draw a sample. In East Jerusalem, where experience shows that the municipal records do not correspond fully with addresses, area segments are chosen and mapped. Subsegments are chosen within each segment and interviews are attempted with all dwellings in these areas.

Additional data sources are used to cover persons not represented in the primary frames. In the larger localities, the sample is supplemented with units drawn from a list consisting primarily of new dwellings in order to incorporate dwellings that became occupied between the time the sample was drawn and the quarter of the interview. Each year, a sample of dwellings in student dormitories at the seven large universities and immigrant absorption centers is drawn using lists obtained from these institutions.

The sampling units are primarily dwellings drawn from the municipal records, each of which may include more than one household. A small minority are households (in villages) or persons (kibbutzim). All persons belonging to the survey population who reside in a dwelling (or

[2] Labor Force Surveys, 2000 (Central Bureau of Statistics, 2002) provides a more detailed description of the sampling procedures.

household) are eligible for an interview. One eligible person is interviewed in each household, providing data for all eligible persons in the household.

The sample is drawn as a two-stage cluster sample within strata, with clustering of persons within dwelling. First, localities are selected roughly in proportion to size, with the larger localities included with certainty and smaller localities included through random selection (The random selection process is adjusted to reduce the likelihood that a given small locality is included repeatedly). Second, within most selected localities, a sample of dwellings is drawn. The sample is drawn so that the ultimate sampling probability, which is the product of the probabilities of selecting a locality and a dwelling within locality, is approximately equal across sampled dwellings.

The sample from the Arnona records is drawn once a year. The Arnona sample, together with the selections from kibbutzim, moshavim, villages, and other supplemental samples, is divided into four representative sub-samples, roughly equal in size, known as panels. Cases for large localities are assigned to each of the four panels; those in smaller areas are assigned to fewer panels to ease the burden on the field staff. Initially, the panels are sent to the field in consecutive calendar quarters, starting with the last quarter of the calendar year in which the sampling takes place.

The average sample size of the panels fielded between 1996 and 2000 was 2738, of which an average of 2327 households were ultimately interviewed in each quarter.[3] Units that were not ultimately interviewed fall into one of three groups: not eligible for the survey; eligible, but not interviewed; and unknown status. The definitions of these categories and their distribution are described more fully below.

Each sampled unit is assigned to a planned interview week, numbered 1 to 13, which indicates when an interview will first be attempted with the residents. The interview must be completed within that week or one of the following three weeks.[4] Interviews are rarely attempted before the planned interview week. The interview questions concerning employment are asked regarding the week before the actual interview date – known as the reference week – whether or not it corresponds to the planned interview week. The distribution of reference weeks from the interviewed sample is not expected to reflect precisely the 13 weeks in the quarter, as interviews regularly occur after the planned interview week.[5]

Finally, the persons living in a sampled dwelling and their eligibility for the survey may change between waves. The survey is intended to represent eligible persons residing at the sampled dwellings at the time of the first attempt for each interview. Data from the panels drawn in 1996-1998 show that in each wave roughly 4-6 percent of eligible non-kibbutz dwellings have a household switch out of the sample between successive waves. In 80 percent of these units, a new household enters in the next wave, presumably to replace the exiting household.

I.2 Calling Procedures

The approach to calling and responsibility for interviews vary by wave. In the first and fourth waves, interviews are generally conducted in person. Interviewers operate out of local area offices and typically are responsible for packets of 10-12 dwellings per week. In the second and third waves, interviews are generally conducted by phone. In the past, telephone interviews were attempted from local offices, under the supervision of local staff. However, since the

[3] These data refer to numbers of attempted and actual interviews. For contacted dwellings, the data reflect the number of households present. For each noncontacted dwelling, one unit is generally included.

[4] Cases assigned to the 13th week of the quarter are given two weeks of follow-up rather than three.

[5] In the panels drawn between 1996 and 1998, 66 percent of the households in their first and fourth waves were interviewed in the planned week, as compared with 78 percent in their second wave, and 73 percent in their third wave.

implementation of the Blaise Computer Assisted Telephone Interviewing (CATI) system for cases in their second and third waves, the vast majority of telephone interviews in these waves have been conducted from the central calling facility in Jerusalem, under supervision of their staff. Non-Blaise telephone interview attempts for all waves are conducted from the local offices.

First and fourth waves. The general approach to interviewing in the first and fourth waves is as follows.[6] An in-person interview at an address known to be a dwelling must be attempted at least three times.[7] In case of refusal, the interviewer may try again or involve the supervisor. Generally, interviewers are encouraged to pursue an interview on their own, but not in such a way that leads to a "shut door". If the supervisor becomes involved, the household will be sent a "refusal kit," which includes background information and a description of the legal requirement to provide an interview. This is followed by an additional attempt or attempts. Should repeated attempts not yield an interview, generally the interviewer, with the permission of the supervisor, or the supervisor directly, will attempt an interview by telephone.[8] A telephone attempt is often made after a week or two of in-person attempts from the local office.[9]

The Survey Unit prefers that first-wave interviews be conducted in person. By conducting the first interview in person, the interviewer is expected to build a relationship with the household that can help to obtain responses on the following waves. In addition, the interviewer can make sure that the right dwelling has been located and that it is occupied. Finally, an in-person first interview also may help with the tedious task of obtaining background data on the membership of the household and their relationships.

The fourth wave of the LFS is usually attempted in person as well. The fourth wave acts as a lead-in to the Income Survey, which should be conducted in person. Households in kibbutzim and moshavim, which are not included in the Income Survey, generally have their fourth wave interviews by telephone.

In the first wave of the LFS, information is solicited to help contact the household in subsequent waves. Households are asked whether they have use of a telephone (home and cell) and for the phone numbers. In addition, households can express a preference that subsequent interviews be conducted in person. Households without access to a phone or with a strong preference for an in-person interview are assigned to have in-person interviews attempted in subsequent waves. Data are also collected regarding preferred time for an interview.

Second and third waves. In the second and third waves, most interviews are first attempted by telephone. Both first-wave respondents and non-respondents are generally approached by telephone on these waves. A letter is sent as a reminder in advance of the first call.

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[6] The procedures described here for obtaining interviews apply to most of the sample. They do not apply to cases from kibbutzim, which are only interviewed by phone, even in the first and fourth waves; households without telephones (primarily Bedouins in the south); or households in East Jerusalem, which since the start of the second intifada are primarily interviewed by phone. Cases from moshavim are typically interviewed in person in the first wave and by phone in the fourth wave.

[7] Background information is sent to the household one week before the first interview attempt. The household is told that they have been selected for an interview and that an interviewer will call in the next few days. The letter also includes a colorful brochure describing the survey. However, the interviewer is not allowed to call a household before the first visit for fear that households will use scheduling of a call to evade the interviewer or that a phone refusal will make it more difficult to obtain an interview in person.

[8] Since October 2000, it is more difficult to obtain in-person interviews in the West Bank settlements. In-person attempts are often undertaken with an armed guard, with several interviewers sent to interview on the same day. Interviewers are said to be afraid. Repeated in-person visits are less likely and follow-up (or the original attempt) is often by phone.

[9] Recent data show that roughly 67 percent of final refusal cases and 40 percent of non-contacted cases were tried by phone.

Among the cases attempted by telephone, most calls are scheduled and interviewed using the Blaise computer software located at the centralized calling facility in Jerusalem.[10] This software was implemented in April 1999 for wave two and in January 2000 for wave three. Cases are prioritized using a combination of parameters preset in Blaise and supervisor input.[11] Calls may be attempted many times over the four-week period and no precise rules govern the number of attempts made.[12] Some cases are still handled with pre-Blaise methods. These include:

- Dwellings that in the first wave were found to be uninhabited, without a phone, or inhabited by persons who requested an in-person interview, which are attempted in person;
- Multiple household dwellings, which are attempted by phone using paper and pencil interviewing (PAPI) from the central calling facility; if the presence of multiple households is discovered while calling the household, only additional households are attempted by PAPI; and
- Non-Hebrew language interviews, which are conducted by phone using PAPI from local offices.

Before Blaise, nearly all cases that could not be interviewed by telephone were attempted in person. Operationally, this was relatively simple, since the phone calls were made from the local offices. Since Blaise, however, if CATI interviewers cannot obtain an interview, a decision must be made regarding whether and when to send the case from the central calling facility to the local areas for an in-person interview. The Survey Unit finds this complicated to do well. The decision requires consideration of when additional phone calls are expected to be less effective than an in-person visit and whether local area personnel are available to undertake interviews in specific locations.

The practice for sending cases to the field has evolved since the start of CATI. The current practice (mid-2002) is to try to limit field attempts to units for which no working telephone number is known or there is no answer.[13] Even if these conditions are met, the case will only be sent to the field if local personnel are available to handle the case. Initially cases were sent after two to three weeks; more recently, LFS personnel report that this was shortened to one to two weeks. Even so, the number of opportunities to send cases to the field is limited, given that the information is delivered by hand and that relatively few trips are made from the central facility to the field offices.

I.3 Field Tools

Absentee questionnaires. In some cases, when a household does not respond to requests made in person or by phone, interviewers will leave an absentee questionnaire for the household to

[10] Statistics Netherlands developed the Blaise software. More information is available from their web site, http://neon.vb.cbs.nl/blaise/default.htm.

[11] Although the dates and outcome codes from in-person visits and the number of telephone calls are entered into the CATI system, these data are not used to schedule calls from CATI during subsequent waves. However, responses to questions about preferences regarding telephone calls are used to route to the field persons with hearing problems or a strong preference for an in-person interview.

[12] Data from the CATI system for two panels assigned to the last quarter of 2001 reveal a mean number of calls to interview of 2.8 (taking 2.3 days) and a median number of calls slightly over 1. Five percent of the completed interviews required nine calls or more. Among non-interviewed CATI cases, the mean number of attempts was 11.7 (taking 15.3 days); 5 percent of the households were tried 26 or more times.

[13] According to Survey Unit staff, lack of phone access often occurs following a change in the household at the address. The reason is that many households move and take their phone number with them. If the previous inhabitants do not know the phone number of the new inhabitants and it cannot be easily obtained from other sources, an in-person visit may be scheduled.

complete. The absentee questionnaire contains fewer questions and is easier to complete than the full questionnaire. Questionnaires are included in the quarterly estimates if households return them by the end of interviewing for the quarter. According to the Survey Unit, this effort typically results in 100 additional interviews per quarter, which reduces nonresponse by roughly 12% of the non-respondent households known to be eligible.[14] The survey unit treats responses to the absentee questionnaire as completed surveys for the calculation of interview rates.

Non-Interview questionnaires. Following each failed in-person interview attempt, interviewers are required to complete a non-interview questionnaire. The responses to the questionnaire provide a detailed accounting of why an interview was not obtained in the particular attempt. These data are used to describe more precisely the distribution of reasons for nonresponse.

Envelopes. Interviewers from the local offices maintain an envelope for each household. The envelope initially provides the interviewer with basic information regarding the household, plus information on households with adjacent listings in the file from which the sample was drawn. Over the four waves of the survey, interviewers use the envelope to record the results and details of each in-person visit, as well as less specific information on the outcomes of telephone calls from the field and demographic data about the household.

I.4 Difficult Cases

The Survey Unit staff believes that it is particularly difficult to obtain interviews from members of three groups. First, very religious Jews are difficult to convince to cooperate either in-person or by phone. In rare cases, the office will go through their rabbi to gain permission. Second, elderly persons who live alone are often traveling or prefer not to open the door when at home. Finally, higher-income persons are less likely to participate, since they are more likely to live in fenced-in areas or in buildings with doormen who are instructed not to open the door. The staff observes that there are fewer problems gaining participation among Arabs.

II. Definitions and Data

The aggregate interview rates and sources of nonresponse used in this report are based on counts of completed interviews and data from non-interview questionnaires, envelopes and the Blaise system. These data are aggregated by calendar quarter and panel for all of Israel and analyzed for the period 1996–2000. For each quarter, the unweighted distribution of the outcome of interview attempts is available by panel.

II.1 Definitions

For each wave and quarter, the numbers of interviews and noninterviews by reason are reported. Three broad categories of nonresponse are distinguished:

(1) Zeros – not belonging to the population;
(2) Eligible non-respondents; and
(3) Non-respondents of unknown eligibility.

The zeros include non-residential addresses (e.g., businesses and warehouses), duplicates on the frame, uninhabited residential dwellings (destroyed, being finished or repaired, or vacant),

[14] Recent data suggest that closer to 66 absentee questionnaires are completed for each panel sampled in 1996-1998 over the four waves.

and residential dwellings with residents who either primarily live elsewhere in Israel or are not included in the target population (e.g., tourists and short term foreign workers). Eligible non-respondent cases are divided among noncontacts (including those who are absent and temporarily out of Israel), refusals, and "other". The category "other" combines cases tried only by phone, cases with a temporary problem, and those with no one able to respond to the survey. Some of the cases in this category are "soft refusals": that is, the household does not intend to respond, but does not fully refuse. As will be explained in more detail in Section II.2, the subcategories of "other" are combined because of data limitations. Finally, cases of unknown eligibility are of three types: not located, not attempted, and located but eligibility remains uncertain. These categories were aggregated from detailed categories, using an allocation scheme developed by Ms. Malka Kantorowitz.

For most of the analyses presented here, the *interview rate* is defined as the number of households interviewed, as a percent of the estimated number of eligible households. Rates of nonresponse within various categories also are defined as percentages of the estimated number of eligible households. The denominator equals:

 # eligible households
= Pr (Eligible | Known Eligibility) (# Known Eligibility) +
Pr (Eligible | Unknown Eligibility) (# Unknown Eligibility)
= # Eligible + Pr (Eligible| Unknown Eligibility) (# Unknown Eligibility)

For this calculation, eligible households include households that are interviewed or have a final code of refusal, noncontact, temporary problem, no one able to complete the survey, tried only by phone, and those with data from the envelope or CATI system indicating the category "other". The probability of eligibility for households with unknown eligibility is estimated by wave as the number of households with unknown eligibility in wave *w* with more waves of eligibility than noneligibility divided by the number with unequal numbers of waves of eligibility and noneligibility. This estimate uses only households with unknown eligibility in wave *w* and at least one wave recorded as eligible or ineligible.

Example: Suppose that in wave one of a single panel there are 200 households with unknown eligibility and at least one wave recorded as eligible or ineligible. Of these households, 180 had known eligibility for three waves: one hundred were eligible in all three waves, 50 were eligible in two waves and ineligible in the third, and 30 were ineligible in two waves and eligible in the third. For the remaining 20 households, eligibility was known for two waves only: five were eligible in one wave and ineligible in the other, and the remaining 15 were ineligible in both waves. For the numerator we have all households with larger number of waves with eligibility, that is, 100+50=150. For the denominator, we sum all frequencies, except for the five households with equal number of eligible and ineligible waves, that is, 100+50+30+15=195. The probability is thus estimated for this wave by 150/195=0.77.

We average this ratio over the four waves and use that as our estimate.[15] This approach loosely follows that suggested in Lynn et al. (2001).

The number of households per dwelling is not available for all sampled dwellings and as a result, the interview rate may be overestimated slightly. The number of households is typically known for contacted dwellings (respondents and the majority of nonrespondents), but unknown for noncontacted dwellings. The calculation thus may give more weight to households in contacted dwellings as compared with noncontacted dwellings and slightly increase the interview rate. Data from the 1996-1998 samples indicate that this is a minor problem.

[15] An estimate of Pr(Eligible | Unknown Eligibility) was made using a file of panels drawn in 1996-1998. After restricting the data to cases completed before March 1999 to avoid periods with reduced use of the NIQ, the average probability was 0.776. The current analysis is based on a figure of 80 percent.

II.2 Data

Sources underlying the data used. The analysis of nonresponse reported here is based on three data sources: non-interview questionnaires (NIQs), envelopes, and the CATI system. Interviewers are instructed to complete an NIQ after each failed in-person visit to the dwelling. The envelope and CATI data are used primarily when the only attempts are by telephone: either from the field office, in which case the envelope is used to record nonresponse, or from the central calling facility, in which case data from the CATI system are used. The NIQ solicits very detailed reasons for nonresponse, while the envelopes and CATI record only less detailed reasons.

The NIQ asks the interviewer for information on the specific causes of nonresponse (e.g., not located, inhabitants ineligible, noncontact with eligible household) for each visit to the address. For instance, if a building is not located, the interviewer is asked whether the difficulty was in finding the street, the address, or another reason entirely. Overall, 20 questions are asked in different circumstances (e.g., depending on whether someone was at home) regarding the first visit and 12 questions regarding each subsequent visit. These data are then summarized across visits to obtain a final nonresponse code. Seventy-eight summary categories were applied between 1996 and 2000. For most analyses, the summary codes for each wave are aggregated to broader categories.

The envelope is the source of data on nonresponse following pencil and paper interviews for which the NIQ was not completed. The interviewer is required to mark on the envelope a broadly defined reason for noninterview for each visit. In addition, the interviewer is asked to mark the outcome of each telephone attempt from the field. The broad categories include building not found, apartment not found, apartment not inhabited permanently, apartment not used as dwelling, family absent from the house, refusal, not part of the survey population (diplomat, tourist, etc.), and other reason. The category "other reason" combines several very different reasons – temporary problem, no one able to provide an interview, tried only by phone, and never tried – leaving no way to distinguish them in these data.

For non-interviewed cases attempted with the Blaise system and not sent to the field, data are available from the CATI system. These data are recorded in broad categories similar to those on the envelope. Separate categories are available for language problem and temporary problem. However, the category "other" remains quite broad. Although Blaise allows the retention of more detailed data, such data are currently not recorded.

Data from these three sources were combined to produce aggregate counts and proportions of cases for nonresponse categories with an aggregation level similar to those used on the envelope.

Change in data sources over the study period. The use of the NIQ decreased considerably over the five years represented by our data. The decrease is particularly sharp in the waves that implemented CATI – wave two (implemented CATI in April 1999) and wave three (January 2000) – but it also occurred in waves one and four. Through the first quarter of 1999, a non-interview questionnaire was completed for 96 percent of the non-interviewed cases. In the last three quarters of 1999, this fell to 57 percent among nonresponding households in wave two and 77 percent for those in other waves. In 2000, non-interview questionnaires were completed for only 50 percent of the non-responding households in the two CATI waves and 84 percent of those in the first and fourth waves. [16]

Reduced completion of the NIQ appears to have been caused by a combination of two factors. First, following the implementation of CATI, the share of cases without an in-person visit increased significantly, particularly among wave two and three cases handled with CATI.

[16] In the second and third quarters of 1999, a temporary problem in collecting and processing non-interview questionnaires led to extremely high use of envelopes and CATI for non-responding cases in their first and second waves. For wave two, this coincides with the start of CATI.

Second, at least since 1999, the NIQ is no longer typically completed for cases without an in-person visit; for cases only tried by phone with CATI, it is almost never completed. These factors combined to reduce completion of the NIQ and increase reliance on other data sources.

Implications for data analysis. The increased share of calls without an in-person visit and the resulting reduced use of the NIQ has two major implications for our analysis. First, only the broad nonresponse categories used on CATI and the envelope can be used for aggregate analysis. After the implementation of CATI, the percentage of estimated eligible cases assigned to the category "other" (or one of the corresponding NIQ categories) more than doubled in waves two and three, with much of the increase coming from cases coded with CATI or the envelope. Insufficient data are available to assign these cases to the subcategories that are used in the pre-CATI data. We thus have no precise data on how many of these cases were tried only by phone, had temporary problems or were not tried at all.

For our analysis, we use the broad categories refusal, noncontact, and "other". We adjust the category "other", to restrict it as completely as possible to eligible cases. All households with an NIQ indicating temporary problems, no one able to respond, or tried only by phone are included, as well as households with data from CATI and envelopes that were assigned the category "other". Cases assigned to the "other" category using CATI or the envelope include a small number of households that were never tried in person or by phone. They are included in our category of eligible "other" cases, because the CATI and envelope data do not indicate if they were not tried by phone or in person.[17] Our category "other" excludes cases with an NIQ indicating that they were never tried; these cases are counted here in the "unknown eligibility" category. According to the Survey Unit, this should cover most cases that were not tried.

Furthermore, the interpretation of contact rates and their change over time is complicated by the post-CATI increase in phone-only cases and how they are coded. Survey staff assign the outcome noncontact only if an in-person visit was attempted; otherwise, phone-only noncontact cases are coded as "other". This is in contrast with phone-only refusal cases, which are coded as refusals. If, as we expect, a large share of the cases not contacted by phone also would not be contacted in-person, then the reduction in the number of phone-only cases sent to the field would reduce noncontact rates as compared with sending all noninterviewed phone cases for an in-person visit (the pre-CATI practice). This relative reduction in noncontact rates would not be due to an improved ability to contact households – but to a reduction in in-person visits to households that cannot be contacted by phone. A change in coding procedures should be considered that assigns noncontacted phone-only cases to a separate category, allowing researchers to make alternative assumptions regarding the treatment of such cases.

Comparison to published interview rates. A comparison of data used in this study to those published in the LFS annual reports shows some differences. The comparison is for two years: 1996 and 1999. The base number of cases in the two sources is quite similar: The numbers of attempted interviews (excluding those of unknown eligibility, which are apparently not included in the published figures) differ by less than 0.1 percentage point out of nearly 11,000 cases, as do the numbers of interviews. The number of cases not belonging to the population is approximately 8-11 percent lower in the published data, roughly offsetting a comparable number of non-interviewed eligible cases. Differences in the allocation formula lead to an interview rate in the data used here that is only slightly lower than the published rate. In 1996, the data used here yield an interview rate as a share of the estimated eligible population of 92.6 as compared with 92.7 in

[17] We have no accurate data on the number of such cases. A small number of these cases come from the central calling facility. Survey Unit staff report that all CATI cases with correct phone numbers are tried; however, if a phone number is not available due to a change in the household living there and the case is located in a somewhat remote area, it may not be sent to the field for in-person interview.

the publication; in 1999, the data used here yield an interview rate of 90.8 as compared with 91.0 in the publication.

III. Trends from 1996 through 2000

In this section, interview rates, non-interview rates by eligibility and reasons for nonresponse are described for the years 1996 through 2000.

III.1 Interview Rates

The interview rate in the LFS ranged from 89 to 93 percent over the period 1996 to 2000. As explained earlier, the rate is defined as a percentage of *cases estimated to be eligible*. Over the 20 quarters, the unweighted average was 91.0 percent, with a standard deviation of 1.3 percentage points. If cases with unknown eligibility are excluded from the denominator, the interview rate is somewhat higher, ranging from 89 to 94 percent with an average of 91.8 percent.

A plot of the quarterly interview rate from 1996 through 2000 is shown in Figure 1. The data show a modest downward trend over the period. The rates dipped down in 1997, returned to higher levels in 1998 and then declined through 2000. The cause of the 1997 dip is unknown, while the 1999-2000 decline coincides with the start of CATI. [18] As we show below, the reduction is prominent in the waves that implemented the telephone calling software.

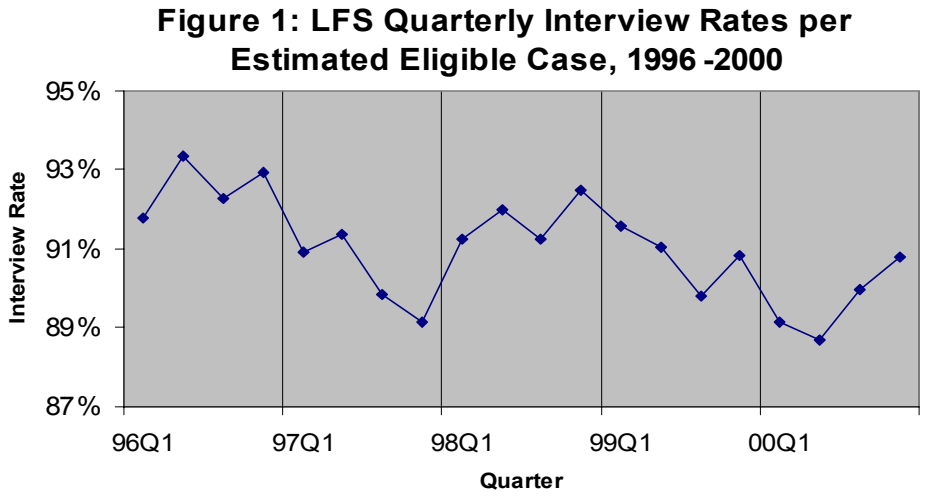
A linear regression model of the quarterly interview data on time confirms the trend from Figure 1, showing an average drop in the interview rate of 0.13 percentage points per quarter over this period (or 2.6 percentage points over the 20 quarters). A model that adjusts for first order autocorrelation estimates a similar decline. Groves (1989) points out that changes in response behavior are likely to be observed only if data are available for long periods. Hence, this result should be treated with caution.

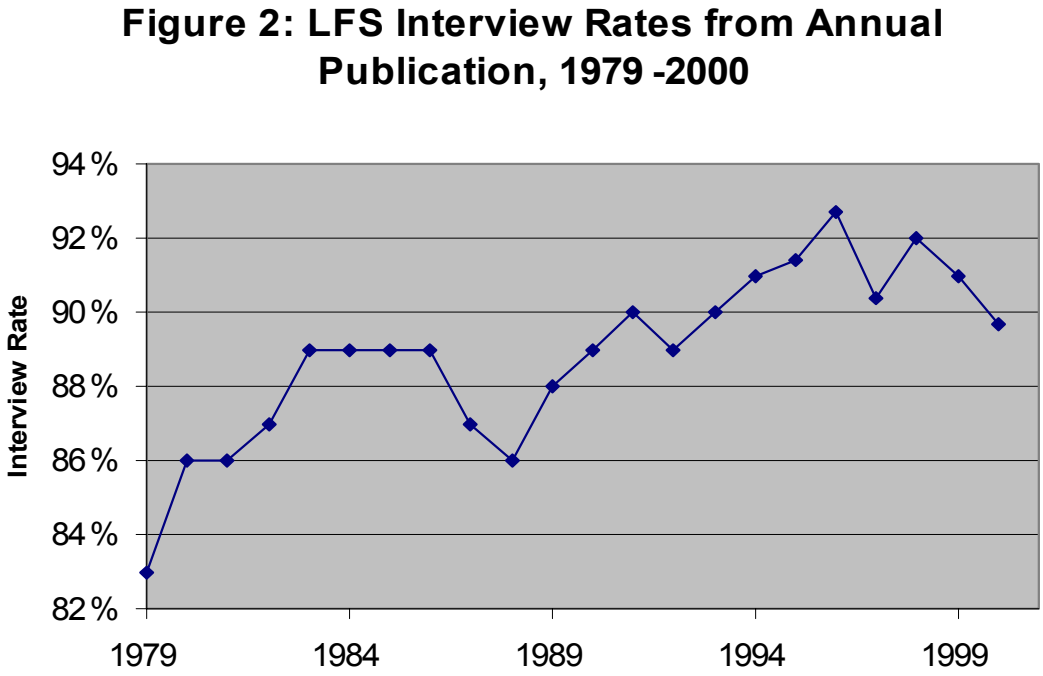
Data compiled from the LFS annual reports also suggest caution in interpreting the short-term trend analysis. As can be seen in Figure 2, prior to 1996, interview rates were increasing slowly over time. From 1980-1988, reported interview rates ranged between 86-89 percent, while from 1989-1995 the rates ranged between 89-91 percent. The first year of our data, 1996, is the peak of a slow upward trend, with an interview rate of 92.7 percent. It may be, as some have suggested, that the upward trend itself was due to changes in methods of recording data over time. However, one cannot ignore that the start of our period may be a peak in interview rates, so that the downward trend simply returns the interview rates toward their historic values.

International comparison. An international comparison suggests that the interview rate for Israel's Labor Force Survey is not out of line with those of many western countries. A recent paper by Wim de Heer (1999) of Statistics Netherlands reports the interview rates for labor force surveys from 16 European and English-speaking countries. Data are reported from 1991 until 1996 or 1997 for most of the surveyed countries. Some caution is warranted, as definitions of the rates are not given.[19] During this period, the reported interview rate of Israel's LFS was 90.8; the mean for all countries excluding the Netherlands was 89.6 percent. Israel's rate ranks ninth

[18] Aggregate data by locality show that the dip was mainly attributed to Jerusalem and apparently was accompanied by an increase in non-contact rates, with a much smaller increase in refusals. Among cases in their third wave in Jerusalem, there is a very large increase in nonresponding cases tried only by phone.

[19] The paper states that response rates are calculated as a share of the field sample. However, rates for the U.S. and Canadian (and presumably other countries) do not include vacant houses, etc. in their denominators and are instead based on eligible cases. As a result, we believe that the rates for Israel and other countries use reasonably comparable definitions.





among the 17 countries (see Table 1). While above average, this is lower than the rates of the U.S. and Canada, countries that are often taken (at least by North Americans) as the standard for government surveys. Among countries with a legal requirement to participate in government surveys, four have higher and two have lower interview rates than Israel.

III.2 Distribution of Non-interviews as Share of All Cases

Next, we examine the eligibility of the cases in the sample. On average, 6.4 percent of sampled cases are not eligible, either because the units were not dwellings or because their occupants were not eligible for the LFS (tourists, diplomats, etc.) As can be seen in Figure 3, the ineligibility rates show a seasonal pattern, peaking in the third quarter (on average, since a new panel is sent to the field in the fourth quarter of a calendar year, the third quarter is farther from the date when the

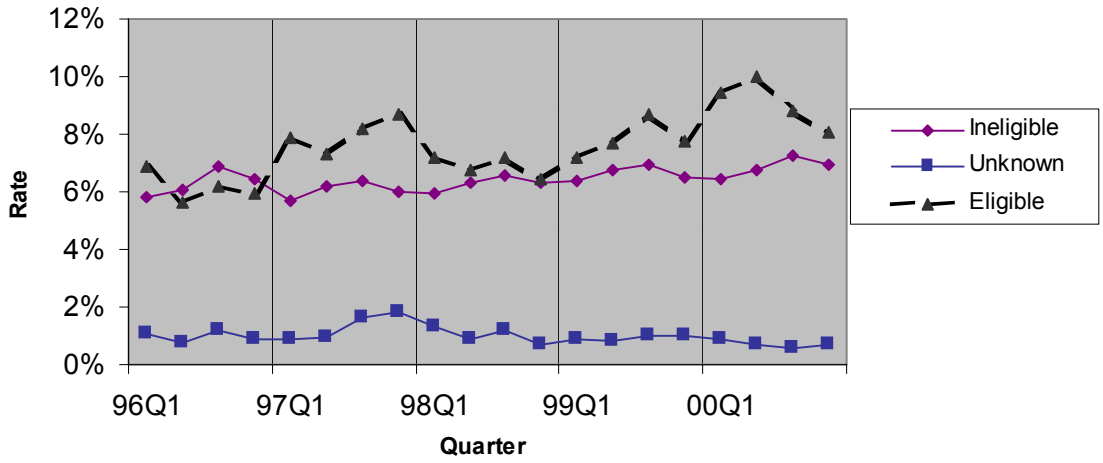
sample is drawn than other quarters). An additional 1.0 percent of sampled cases are of unknown eligibility, either because no interview was attempted or because the address could not be located. Finally, an average of 7.6 percent of sampled cases are eligible but not interviewed. Over the five-year period, this rate varies from roughly 6 to 10 percent, with a modest increase over the time.

Table 1: Comparison of Mean LFS Interview Rates: Israel versus Countries Reported by de Heer (1999)

Country	Interview Rate (%)	# of Years
Netherlands	58.3	6
Denmark	77.8	5
United Kingdom	81.5	6
Hungary	82.8	6
Belgium*	84.5	6
Sweden	87.0	5
Slovenia	88.8	5
Spain*	89.7	6
Israel*	**90.8**	**6**
Finland	91.3	6
France*	91.8	5
Poland	92.0	5
USA	93.8	6
Ireland	94.3	3
Canada*	95.0	5
Australia*	96.2	5
Germany (avg. of E. and W. Germany data)*	97.7	5.5

*Countries with a legal requirement to participate
Calculations by authors from data published in de Heer (1999)

Figure 3: LFS Quarterly Non-interview Rates (Percent) By Eligibility, 1996-2000

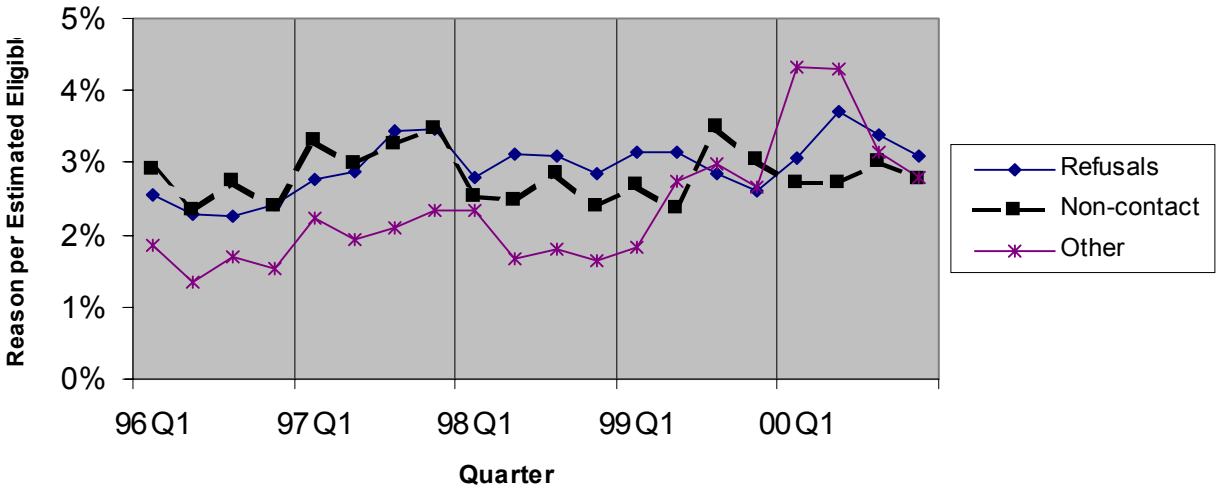


III.3 Nonresponse by Source

Data on refusals, noncontacts and other sources of nonresponse between 1996 and 2000 are reported in Figure 4. On average, approximately 2.9 percent of households estimated to be eligible refused, 2.8 percent were not contacted, and 2.4 percent were not interviewed for other reasons (temporary difficulties, such as illness or funerals, no one able to complete the interview, or interviews attempted only by telephone). A dramatic increase in the category "other" can be seen in Figure 4 and is generally attributed, at least in large part, to an increase in the number of cases attempted only by telephone. These estimates, plus the interview rate, sum to slightly less than 100 percent. The reason is that the denominator of each rate includes a proportion of the cases of unknown eligibility, which is not part of any numerator.

The combined number of noncontact and "other", as well as the number of refusals, increased relative to the estimated number of eligible households over the entire period. However, the gradient increased significantly for the sum of noncontacts and "other" in the year starting in the second quarter of 1999.

Figure 4: LFS Refusals, Noncontacts, and Other Reasons as Share of Estimated Eligible Cases



Using data prior to 1999 provides a more definitive separation of noncontacts and other nonresponse. Between 1996 and 1998, refusals and noncontacts occurred at similar rates (2.8 percent of households each); other reasons were attributed at roughly 2/3 of this rate (1.9 percent). Among respondents who are eligible, this translates to 3/8 of nonresponse due to refusal, 3/8 due to noncontact, and the remaining quarter split among other sources.

IV. Findings by Wave

In this section, the levels and trends of interview rates and reasons for nonresponse are analyzed by wave. First, we begin by examining variation across waves. Interview rates and accompanying reasons for nonresponse might be expected to vary by wave – especially for waves one and four versus two and three – since the mode of interview in the LFS varies by wave, as does the administration of the survey. In addition, the reaction of potential interviewees to participation requests can be expected to change over the waves: In the later waves, they may take into account their previous experiences with the survey, interviewer, etc.

We next examine time patterns within each wave. Such an analysis can give a sense of whether phenomena observed in the overall trend (Figure 1) are uniform or specific to particular waves. Trends are expected to be somewhat different across waves, generally, due to changes in the procedures or the societal context (e.g., introduction of technology such as cell phones) that may affect the success rates of only in-person or telephone interviews attempts. In addition, to the extent to which management and staffing of the survey differ by wave, personnel problems, changes in management responsibility, or other changes that affect productivity could lead to different patterns across waves.

A major focus is on the implementation of the Blaise CATI system, which was the principal change in the LFS methodology during this period. To date, the Blaise software has only been implemented for wave two (April 1999) and wave three (January 2000). If the implementation or operation of Blaise influenced the interview rate, that effect should be observable in the waves for which Blaise was implemented in the period during and after implementation.

IV.1 Interview Rates by Wave

Annual data on interview rates by wave are reported in Table 2; quarterly data are presented in Figure 5. Interview rates in the top half of the table and in the figure are calculated as a percent of estimated eligible households. For comparison, the lower half of the table presents data calculated as a percent of known eligible households. The patterns for known eligible households are somewhat different; we focus on estimates using the numbers of estimated eligible households, because we believe that they provide a better measure of the interview rate.

Table 2: LFS Interview Rates by Wave

Item and Period	Wave 1 (%)	Wave 2 (%)	Wave 3 (%)	Wave 4 (%)	All	
					Mean (%)	N
Interview rate per *estimated* eligible case						
1996-2000	90.0	91.5	91.1	91.4	91.0	80
Pre-1999Q1*	90.1	92.3	92.3	91.5	91.5	52
1996	91.7	93.0	93.2	92.5	92.6	16
1997	88.1	91.6	91.3	90.3	90.3	16
1998-1999Q1	90.4	92.3	92.5	91.7	91.7	20
1999Q2-1999Q4	89.7	90.2	91.4	91.0	90.6	12
2000	90.1	89.8	87.1	91.6	89.7	16
Interview rate per eligible case						
1996-2000	91.0	92.3	92.0	91.9	91.8	80
Pre-1999Q1*	91.2	93.2	93.2	92.0	92.4	52
1996	92.7	93.6	94.1	93.0	93.4	16
1997	89.6	92.8	92.1	90.9	91.3	16
1998-1999Q1	91.4	93.2	93.2	92.2	92.5	20
1999Q2-1999Q4	90.5	91.0	92.2	91.5	91.3	12
2000	90.8	90.2	87.8	91.9	90.2	16

*1999Q1 – First quarter of 1999

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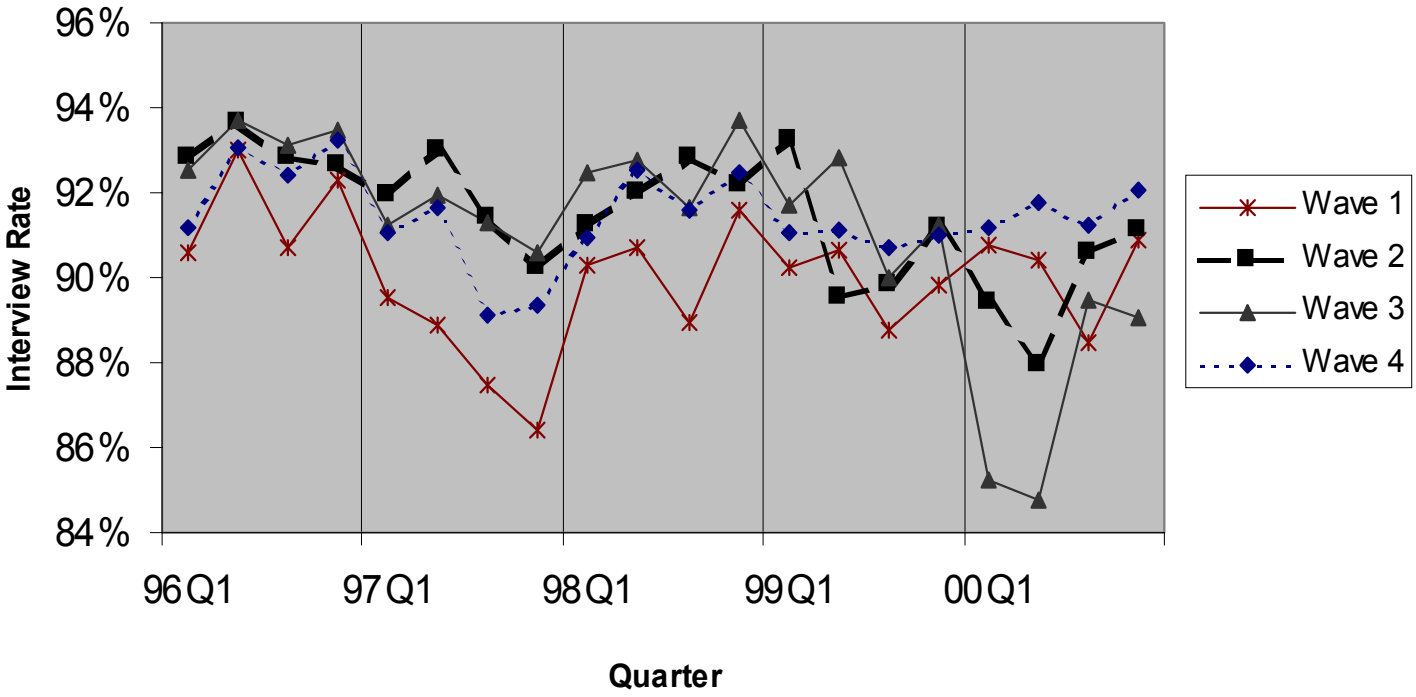
Figure 5: LFS Interview Rate by Wave, as Share of Estimated Eligible Cases



Pre-CATI patterns. Examination of the average interview rate by wave (Row 1 of Table 2) reveals that the average interview rate in wave one is lower than in subsequent waves. Among first wave cases, the interview rate is 90.0 percent of the estimated number of eligible cases. This is 1.1 - 1.5 percentage points lower than the rates in waves two and three and 1.4 point lower than the rate in wave four. This finding is confirmed by cross-wave comparisons, which show that the interview rate in wave one was lower or approximately equal to those in other waves in all 13 quarters before the implementation of CATI in April 1999. We also note that in the pre-CATI period wave four rates were lower than those of waves two and three.

Regression analysis was used to test whether interview rates are statistically different across waves. The interview rate is analyzed using a repeated-measures model. The covariance matrix is block diagonal, with an unstructured covariance matrix within each panel. Proc Mixed in SAS was used to jointly estimate the means for each wave, the elements of the variance-covariance matrix, and standard errors that account for the correlations within panels. Statistical significance is defined using two-tailed tests with a 0.05 significance level; the adjusted p-values account for multiple pairwise tests. The sample for this analysis includes all quarters of data, except for those in waves two and three following the implementation of Blaise.

As can be seen in Table 3, the tests provide evidence that in the absence of Blaise, the interview rate among the estimated eligible households in the first wave was significantly lower than those in waves two and three (by 2.2-2.4 percentage points). The interview rate for wave four is slightly lower than that of wave three. Other comparisons show a significant difference between waves four and one (1.7 points, p=0.003). Somewhat surprisingly, given the time lag between waves, the difference between waves two and three is small (0.24 points) and not statistically significant (p=0.90).

The point estimates are slightly different from those described earlier, because of the exclusion of data for waves two and three after the start of Blaise. Alternative specifications, including restricting the sample to the pre-1999 period for all waves and using different assumptions regarding the variance-covariance matrix generally yield similar results.

Table 3: Regression Estimates of Differences between Waves in LFS Interview Rate per Estimated Eligible Case (Percent), Non-CATI Waves 1996-2000

Wave	Regression estimated Mean	Difference relative to wave one	Standard error of difference	Adjusted p-value for difference
1	89.77	--	--	--
2	92.17	2.40	0.29	<0.001
3	91.93	2.17	0.46	<0.001
4	91.44	1.67	0.42	0.003

These results are somewhat surprising. One might expect that the first wave interview rate would be higher than other waves, given: (1) it is conducted in person and in-person interviews typically have higher response rates than comparable phone surveys; (2) attrition among participants is inevitable; and (3) participation rates among nonrespondents in previous waves might be expected to be moderate since a share of nonrespondents has already refused.[20]

[20]To get a sense of the magnitudes involved, consider the change in interview rates between wave *t* and wave *t-1*: $I(t) - I(t-1) = p(t)\ [100 - I(t-1)] - a(t)\ I(t-1)$, where $I(t)$ is the interview rate in wave *t*, *p* is the participation rate among non-respondents in the previous wave, and *a* is the attrition rate among participants from the previous wave. Given interview rates in the first wave of $I(1)=90$ percent and an attrition rate of $a(1)=0.1$, participation rates among previous non-respondents must be at least $p(2)=0.9$ to

CBS staff offer two alternative explanations. First, the burden on interviewers is greater in the first wave than in subsequent waves, as interviewers need to locate many addresses for the first time, as well as to visit non-residential addresses that will not be called in later waves. Thus, sufficient resources may not be allocated to obtain the participation of many households. In the second wave, where interviewers have sufficient resources to make repeated calls or contact all households, the residents are eventually willing to participate. An alternative explanation is that the problem is not a shortage in resources that are allocated to the first wave but rather that those who refuse "soften" in later waves. An examination of between-wave transitions in response outcomes might provide some insight into both theories.

Evidence from the United States shows that an increase in second wave interview rates is not unique. The Current Population Survey, which is the primary source of U.S. unemployment data, has a rotation pattern of four months in the sample, eight months out, followed by an additional four months in the sample. As in Israel, the first wave is conducted in person. Atrostic et al. (2001) report a large increase in the interview rate in the second wave and attribute it to many factors, including a drop in the share with no one at home.

Examination of interview rates over time by wave (Figure 5) can give some insight as to whether the source of the large drop in the interview rates in 1997 is general or specific. The interview rates fell in all waves, with the most dramatic drops for cases in waves one and four. The reason for this drop is not clear, although as noted earlier, it occurred primarily in Jerusalem**.**

Post-CATI patterns. In contrast to 1997, in 1999 and 2000 interview rates fell primarily for waves two and three, with the initial drop occurring with the implementation of CATI for each wave. In wave two, interview rates fell in the second quarter of 1999; rates began to recover, but then fell again at the start of 2000 when the CATI staff began to handle wave three cases; by the end of 2000, rates had moved towards pre-CATI levels. Although the interview rate for wave three cases fell somewhat in the second half of 1999, the sharp decline occurred in the first two quarters of 2000.

Before CATI, wave two interview rates were more than 2.0 points higher than those in wave one; in the last three quarters of 1999, the differential fell to 0.5 percentage point; and in 2000, the differential was –0.3. In wave three, between 1996 and the first quarter of 1999, interview rates were also more than 2.0 percentage points higher than in wave one; in 2000, the interview rates fell to –3.0 (upper part of Table 2). This change in the patterns seems to result from a fall in interview rates in waves two and three: Interview rates for wave one stayed at the average for previous years. Analysis of the signs of quarterly differentials across waves (Figure 5) also suggests that the post-CATI contrast from past patterns was larger for wave three than wave two.

A regression of the interview rate on wave of interview and an interaction of wave and a dummy variable indicating data from the year 2000 supports these findings. The pre-2000 differential between wave one and waves two and three is statistically significant from zero as is the differential for wave three in the year 2000.[21]

These findings suggest that difficulties in obtaining interviews accompanied the implementation of CATI. Although the decreases in interview rates could be the result of pre-existing trends, the precise timing of the changes makes that seem unlikely. However, no data are

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avoid having interview rates fall. If $a(1) = .05$, the participation rate among previous non-respondents must be at least $p(2) = .45$ to avoid having interview rates fall.

[21] If the drop in interview rates under CATI is caused by the difficulty in sending non-interviewed cases to the field from the central office, one might expect fewer problems in the Jerusalem district in which the local and central offices are co-located. In particular, this should ease the problems of arranging for interviewers to visit outlying areas. Unfortunately, we have no data to examine outlying areas by district of local office and a comparison of the data for large cities shows mixed results.

available to distinguish the effect of implementation from that of the program itself or definitively from other changes that occurred at the same time (such as the 1999 civil service strike).

IV.2 Nonresponse by Source: Findings by Wave

The rates of nonresponse due to refusal, noncontact, and other reasons are presented by wave in Table 4 and Figures 6-9. Although we report noncontact and the category "other" separately, we suggest caution when examining differences across waves and over time. Even before CATI, the category "other" contained an unknown share of noncontacted cases that were tried only by phone; this occurred primarily in waves two and three. As a result, cross-wave differences (between waves one and four and two and three) in pre-CATI noncontact rates are expected to overstate somewhat the true differential in noncontact rates. With the use of CATI, this classification problem is believed to have increased considerably, leading to an overstatement of the decline in contact rates between pre- and post-CATI periods. Refusal rates should be comparable across waves and over time, since cases that were tried only by phone and refused are coded as refusals.[22]

Patterns across waves. The data suggest that the lower interview rates in wave one relative to waves two and three are due to higher levels of both noncontact and refusals. Consider, for example, the pre-CATI (1996-1999Q1) interview rate for wave two. The second row of Table 2 shows that the average interview rate for wave two was 2.2 percentage points greater than that for wave one. Table 4 shows that this differential is composed of a 0.95 percentage point differential in the refusal rate, a 1.27 percentage point differential in the noncontact rate, and a net -0.25 differential in "other" which balances higher wave two rates of tried only by phone and lower rates of temporary problems, etc. The patterns of differentials in wave three are similar.[23]

A comparison of the relative rates of noncontacts and refusals observed before CATI across waves suggests that the telephone interviewers working from the local office had no particular advantage in avoiding noncontact as compared with in-person interviewers. For example, in wave one from 1996-1999Q1, the refusal and noncontact rates are 3.4 and 3.6 percent. In wave two, the refusal and noncontact rates are 2.5 and 2.3 percent. Despite the slightly smaller noncontact rate in wave 2, the similarity of the relative rates across waves (3.4/3.6 and 2.5/2.3) suggests that telephone interviewers did not have a major advantage in avoiding noncontact as compared with refusals. This may result in part from the ease with which face-to-face interviewers could make a telephone call to the household following an initial visit to the location.

The regression framework described in Section IV.1 is used here to test the statistical significance of the cross-wave differences in the refusal and noncontact rates before CATI. The sample includes all wave and quarter combinations for which Blaise was not in use.

As can be seen in Table 5, the tests provide evidence that the refusal rate is significantly greater in wave one than in each subsequent wave (by 0.7 – 1.2 percentage points). The noncontact rate is also significantly higher in wave one than in other waves (by 0.7 – 1.5 percentage points). The regressions also reveal statistically lower rates of refusal and noncontact in waves two and three as compared with wave four.

[22]Although the categories of noncontact and other cannot be clearly distinguished, we believe that the separated data: 1) provide a lower bound on the level of noncontacts, with relatively small bias prior to CATI; 2) indicate the need for more detailed data on the nonresponse patterns; and 3) are accurate for waves one and four.

[23] As before, the partial differentials do not sum to the total, since the base includes cases of unknown eligibility that are not included in any of these terms.

Table 4: Reasons for LFS Nonresponse by Wave as a Percent of Estimated Eligible Cases, 1996-2000

Item and Period	Wave 1 (%)	Wave 2 (%)	Wave 3 (%)	Wave 4 (%)	All
Refusal rate					
1996-2000	3.58	2.57	2.64	3.00	2.83
Pre-1999Q1*	3.44	2.49	2.44	3.05	2.86
1996	2.69	2.14	1.97	2.74	2.38
1997	3.93	2.69	2.67	3.30	3.15
1998-1999Q1	3.66	2.61	2.63	3.10	3.00
1999Q2-1999Q4	3.92	2.22	2.43	2.92	2.87
2000	3.79	3.12	3.45	2.90	3.31
Contact rate					
1996-2000	3.65	2.22	2.26	3.18	2.83
Pre-1999Q1*	3.59	2.32	2.23	3.05	2.80
1996	3.14	2.42	2.11	2.72	2.60
1997	4.37	2.52	2.56	3.59	3.26
1998-1999Q1	3.33	2.09	2.06	2.88	2.59
1999Q2-1999Q4	3.85	1.85	2.41	3.81	2.98
2000	3.70	2.15	2.26	3.13	2.81
"other" rate					
1996-2000	1.64	2.85	3.08	1.86	2.36
Pre-1999Q1*	1.64	1.89	2.12	1.82	1.87
1996	1.40	1.76	1.73	1.52	1.60
1997	1.97	1.86	2.63	2.14	2.15
1998-1999Q1	1.56	2.01	2.02	1.81	1.85
1999Q2-1999Q4	1.69	4.86	2.86	1.76	2.79
2000	1.63	4.45	6.36	2.05	2.05

*1999Q1 – First quarter of 1999

Patterns over time within wave. A quick glance at Figures 6-9 is enough to see that the nonresponse story differs dramatically by wave. Waves one and four exhibit relatively stable patterns of nonresponse. Throughout the five-year period, noncontacts and refusals comprise roughly 80-85 percent of the nonresponse in these waves, with the remainder attributed mostly to temporary problems or no one in the dwelling who was able to respond to the survey. For wave one cases, the refusal rate increases slightly as a share of estimated eligible cases between 1996 and 2000; in general, however, the patterns are stable. In wave four, the rates of each source remain stable over time, although they exhibit a cyclical pattern. A little insight is provided into the problems of 1997, where high noncontact rates are observed for wave four and high refusal rates are observed for wave one in the last half of the year.

Table 5: Regression Estimates of Differences in LFS Nonresponse Rates between Waves (Percent), LFS 1996-2000, Non-CATI Waves				
Outcome and Wave	Regression estimated Mean	Difference relative to wave one	Standard error of difference	Adjusted p-value for difference
Refusal rate				
Wave 1	3.68	--	--	--
Wave 2	2.59	-1.09	0.11	<0.001
Wave 3	2.45	-1.23	0.17	<0.001
Wave 4	2.99	-0.69	0.16	0.001
Noncontact rate				
Wave 1	3.73	--	--	--
Wave 2	2.35	-1.38	0.18	<0.001
Wave 3	2.27	-1.46	0.19	<0.001
Wave 4	3.02	-0.71	0.22	0.017

For waves two and three, the story is quite different. Before the 1999 implementation of Blaise in wave two, the sources of nonresponse were relatively stable. The noncontact rate declined prior to CATI, particularly in wave two, while the refusal rate increased. Together they accounted for 70 – 75 percent of the eligible nonresponse in each wave. The remaining cases were in the "other" category. According to data from the NIQ, roughly three-quarters of the "other" cases were tried only by phone and one-fourth had temporary problems or no one able to respond to the survey.

A large increase in nonresponse accompanied the implementation of CATI in waves two and three. Among cases from wave two, the refusal rate fell following the start of CATI and then increased sharply in 2000; among cases from wave three, refusals increased, particularly in the second quarter. Most of the increase is in the category "other", which more than doubled as a share of estimated eligible cases with the implementation of CATI. Noncontact rates changed only a small amount as a share of the estimated eligible cases; their share of all non-respondents fell with CATI.

Data are not available to make further sense of these changes. Common sense suggests that the increase in "other" cases is mostly likely due to an increase in the share of cases attempted by phone and not sent to the field. There is no obvious reason to expect the rate of cases with temporary problems or no one qualified to respond to increase substantially with the use of CATI. Furthermore, although we might expect CATI to lower the noncontact rate, the category "other" includes cases not contacted when tried by phone, making problematic any interpretation of the stability of the noncontact rates over time.

Figure 6: Reasons for NR, Wave 1 of LFS

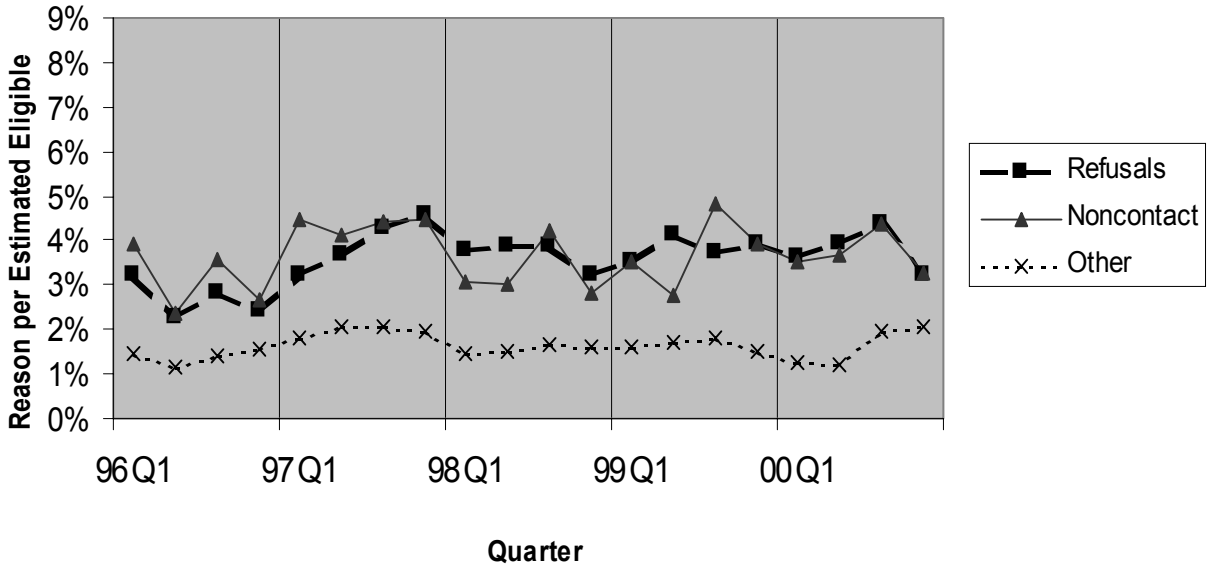


Figure 7: Reasons for NR, Wave 2 of LFS

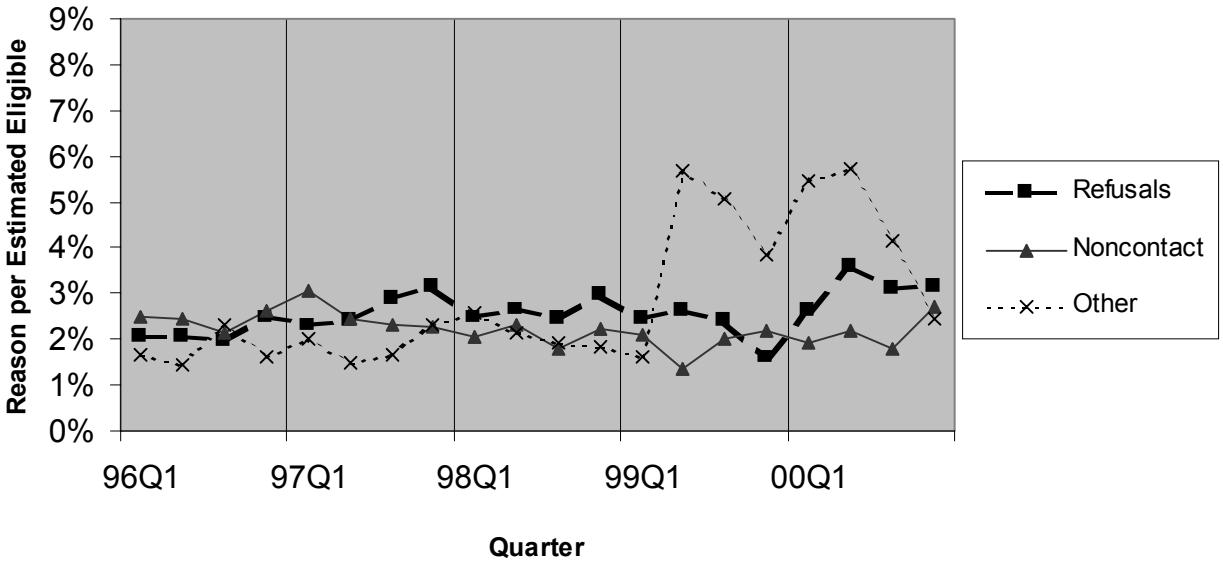


Figure 8: Reasons for NR, Wave 3 of LFS

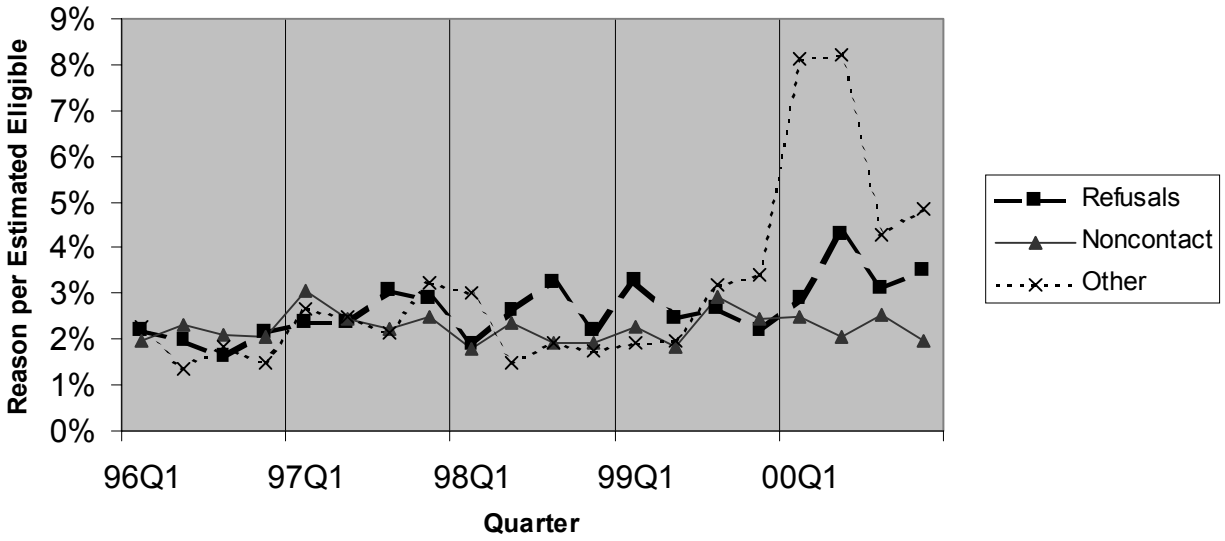
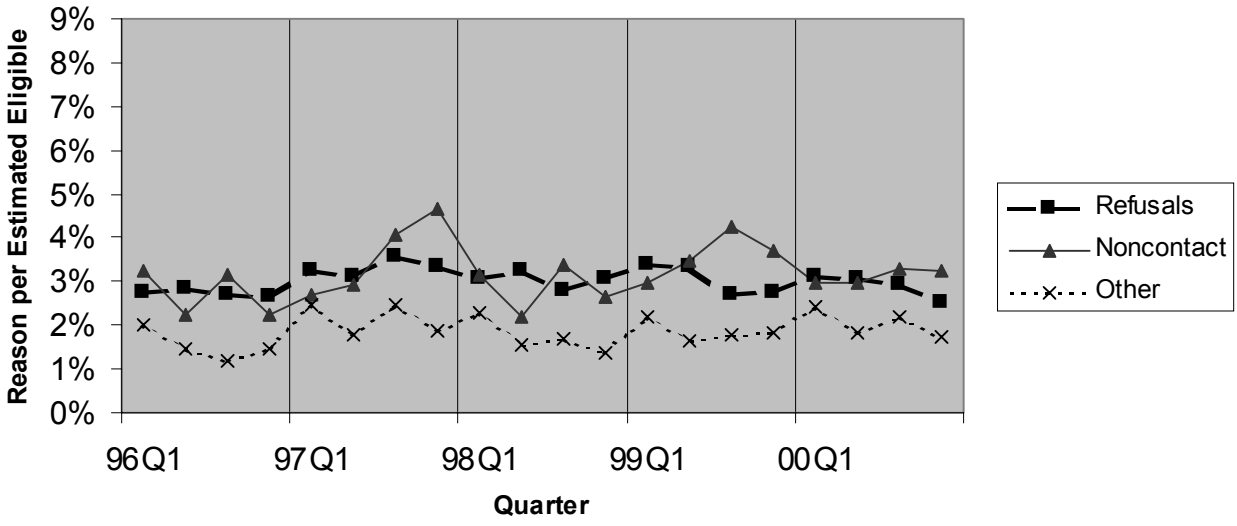


Figure 9: Reasons for NR, Wave 4 of LFS



V. Summary and Interpretation

This report provides an overview of the interviewing procedures of the Labor Force Survey and recent data on interview rates and causes of nonresponse. Key findings include:

- Between 1996 and 2000, interview rates appear to have declined slightly. This decline follows a relatively long period of increasing rates and appears to be concentrated in waves two and three, which are conducted largely by telephone;
- Between 1996 and 1999, interview rates were lower in wave one, which is conducted primarily in-person, than in waves two and three, which are conducted primarily by phone; wave four, which is primarily in person, had rates were closer to those of waves two and three;
- These relationships changed in 2000 and to a lesser extent in 1999, with lower interview rates and apparently changed patterns of nonresponse in waves that implemented the new CATI system.

This raises two obvious questions. First, do the lower interview rates in the first wave lead to more biased estimates in the first wave than in other waves? Insights might be obtained by comparing demographic characteristics, rates of employment and locations of the households that are not interviewed in the first wave, but are subsequently interviewed, to those of persons interviewed both in the first and in a subsequent wave. Research currently in progress suggests that this is not a problem: the differences between respondents and nonrespondents are typically smaller for the first wave than for subsequent waves. Is there a real problem with the workload on the first wave and if so, what can be done to make the interviewer task more manageable? For instance, might there be an advantage to using the telephone more often to arrange visits, or encouraging telephone interviews from local offices? Would it be worthwhile to implement computer technology that can lessen the burden associated with sending cases to and from the phone facility at the central office, allowing interviewers to ease their burden by sending some cases for telephone interviews?

In addition, these data also raise the question: What happened in waves two and three in 2000 to change the patterns of interview rates and sources of nonresponse, especially in the broad category "other"? The main issue is whether the fall in interview rates is the result of either the implementation or continuing operation of Blaise and possibly a change in the follow-up protocol. Thus, should failed attempts by phone be followed in the field more rigorously to yield an interview? The drop in interview rates specific to the waves that implemented CATI is certainly suggestive.

Despite suggestive findings, no firm conclusions regarding the role of Blaise can be drawn from these data. First, any interpretation of the changing patterns of nonresponse requires a better understanding of the increase in the "other" category. Regarding the interview rates, although the pattern is consistent with an impact of Blaise, other factors, such as problems with staffing at the calling facility, could lead to a similar result. Finally, even assuming that the drop in interview rates was due to Blaise, the follow-up period is too short to distinguish the long-run consequences of using the software from temporary difficulties experienced during implementation. Before evaluation, any system needs to "acclimatize" to a new tool. Only follow up for several more years may tell us how patterns stabilize after implementation of Blaise.

Areas for additional research. Overall, the interview rates from the Labor Force Survey are high enough to be reassuring. At the same time, analysis should be conducted to gain a better understanding of whether the non-respondents are very different from respondents and whether their omission is likely to cause bias. Further analyses of the aggregate data by district and interviewer may provide more insight into some of the problems observed in the investigated

period. Better documentation of intervening factors, such as strikes and security problems in different areas, may help to improve our understanding of changes over time.

In an on-going work, we are using micro data to compare the respondents to those non-respondents who have provided data in other waves as a way to describe a subset of the non-respondents. In addition, data for respondents should be examined as a function of the effort used to gain participation; these patterns may provide another way to gain insight into the extent of likely bias due to nonresponse. Although such analyses necessarily exclude those who never respond and rely on stability of characteristics across waves, they can help to assess the likelihood that large biases exist. If these analyses suggest substantial differences between respondents and wave non-respondents, further studies, perhaps involving linking to Population Register or Census data should be devised to gain insight into the characteristics of permanent non-respondents.

The findings also make clear the usefulness of a better understanding of the process that led to an increase in interview rates following the first wave. An examination of detailed data, including both transition rates and reasons for nonresponse, may give some insights. Discussions with interviewers and coordinators as well as listening to interview attempts, may give additional insight into the differential in success between the first and second waves. In addition, examination of the interview rates for first and fourth waves cases for which a telephone interview was tried may indicate the usefulness of further augmenting in-person attempts with attempts by telephone, and circumstances under which such mode switches may be most useful. This work should be accompanied by a similar analysis of the timing and value of augmenting CATI calling attempts with in-person attempts by field staff.

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