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**DATA COLLECTION AND QUALITY ASSURANCE PROBLEMS  
IN CONSUMER PRICE INDICES**

Submitted by the ILO secretariat <sup>1</sup>

**Introduction**

1. Developing a consumer price index (CPI) is a complex process which involves juggling a number of critical tasks which must be completed prior to dissemination of the index. In particular, great efforts are required in the planning stages of a new CPI. Ideally, a consumer expenditure survey provides the basis for the weights and for the selection of items. Once the relevant information is available from such a survey, a number of decisions about the new CPI must be taken: the population group to be covered; the number of items to be included in the index; the primary sampling units from which prices should be collected; and the selection of the sample of outlets. As important as these are decisions concerning data collection and quality assurance. In the early stages of designing a CPI, they are often accorded low priority, but they are critical to its overall success. This paper focuses on the data collection process and how the quality of the data collected can be improved.

**Identifying data needs**

2. Unlike a consumer expenditure survey, which requires an enumerator to make a number of visits to a specific household within a fairly short time period, a CPI requires a data collector to visit an establishment periodically on a regular basis. Depending upon the type of item being priced, it might be monthly, bimonthly or less often. Frequently, data collectors have to complete two questionnaires. One covers information about the establishment (name of owner or manager, address, telephone numbers, type

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<sup>1</sup> Paper prepared for the ILO Bureau of Statistics by Mr. B.J. Hannon, External Consultant.

of establishment, best times to visit, etc.), and is filled in only once during the initial visit. The other is the price collection form.

3. Price collection forms must be designed so that the data collector can accurately collect price data on a specific item and the data can be processed. In one country where initially the reliability of the mail service was doubted, the price collection form was designed as a one-way shuttle form. When first produced, the form comprised 13 pages printed on carbonless paper. This type of paper allowed anything written on the top page to be transferred to the other pages beneath it. There was one form per item. At the beginning of the pricing cycle, data collectors manually transferred a specific item's price characteristics onto the new form.

4. When the item was scheduled to be priced, the data collector recorded the appropriate data on the form and then tore off the top page. The field supervisor reviewed it to make sure the item description, price, etc. were complete and then, when all prices for that month were submitted, the forms were sent to the central office. If for some reason the prices were lost in transit, a backup copy was available to be submitted. Even though no price schedules were ever lost in the mail, it did save time in that the price schedules did not have to be returned to the field for the next cycle of pricing and if there was a questionable price, it could be checked immediately in the central office. The disadvantage of using this type of a one-way price schedule was that errors could occur in the transcribing process when data collectors were going from an exhausted questionnaire to a new questionnaire as well as the cost of producing what were essentially 13 price schedules each year.

#### **Selection of data collectors**

5. The selection of data collectors is critical to ensuring the overall quality of the price data. Once the data required have been determined, the skill level needed for collecting these data should be established.

6. Data collectors can be either full-time or part-time, depending upon the data collection activities required. In countries with limited budgets, part-time employees are preferred. This reduces the data collection costs but, it is hoped, does not impair the overall quality of the data.

7. Data collectors are selected in a variety of ways. In some countries, someone from the central office of the national statistical agency who is familiar with the CPI programme is selected and is sent to the outlying Primary Sampling Units (PSUs) to collect price data.

8. In one country, school teachers were recruited in the outlying PSUs. The school teachers worked a somewhat abbreviated day and were usually free from the mid-afternoon on. They also had the basic qualifications necessary for good data collectors.

9. Other countries have different approaches. In the United States, for example, many data collectors are women whose families have grown and who want to work on a part-time basis; many are college graduates.

10. In order to collect accurate data, the data collector must possess a number of different skills, including literacy, ability to understand the objectives of the programme and to follow complex data collection rules. They must have certain diplomatic skills to enable them to meet a wide variety of personalities, including store managers and owners and service providers and to elicit the cooperation they need for obtaining accurate price data. The data collectors must also be decisive when collecting data and understand how to apply complicated rules for handling problematic situations, such as missing prices, substitutions, etc. A crucial quality of all data collectors is "attention to detail", i.e. they must be very thorough in collecting and recording all aspects of a specific price. Although this quality sometimes seems to be taken for granted, few people have the ability to focus intently on the task at hand at all times.

11. Character is another important aspect. It is essential that the data collector has integrity, honesty and an understanding of the importance of his data collection activities to the success of the programme. Unfortunately, assessing a person's character is difficult in an interview and even by checking references, as referees may be reluctant to provide negative information on an individual. It is only after observing the quality of a person's data collection over period of time and observing him collecting data that a manager may get a glimpse of the person's character.

12. One concern all programme managers have is that the data collector may not provide accurate information and, in some cases, may even falsify information. This situation occurs even in the most developed countries. In the United States, a colloquial term used for this activity is "curbstoning", derived from the image of a data collector sitting on a curbstone and making up price data from a fictional visit to an outlet. Selecting data collectors with integrity is very important to establishing a sound data collection programme.

13. An additional point about "curbstoners" is worth noting. A person who decides to complete a survey without actually visiting the outlet does not know whether a price has changed or not. For many items, especially non food items, prices change infrequently. Because of the uncertainty of knowing whether a price has changed, and the more likely prospect that the price is unchanged, "curbstoners" tend to enter the same price as for the previous period. With the generally widespread availability of computers, a computer programme can be designed to screen for prices that have remained stable for a given number of time periods. In those cases in which a data collector ID code is entered on the price collection schedule, this screening may even be carried out for each data collector.

14. Ideally, candidates must possess predetermined qualifications to be considered for a data collector's position. Each candidate's should include references that can be checked to verify the person's qualifications and character. The prospective data collector should be interviewed by a responsible official to determine the suitability of the prospective data collector for data collection activities. In this way, candidates who are very abrasive or argumentative or too timid to assert themselves in obtaining accurate price data can be weeded out. Candidates with a professional appearance that will encourage the cooperation of managers of the outlets in

the sample can be identified, as well as those who are overbearing, with the risk of alienating respondents. References should be checked thoroughly.

15. Although selecting data collectors with suitable characteristics is very important, less objective means tend to be used in certain countries. Sometimes data collectors are hired by referral, i.e. a candidate for a position is referred by another data collector who is already working in the programme. Sometimes the price statistics director or another manager in the same office may know someone whom they believe would make a good data collector. In countries with few well-paying jobs, it can be very tempting to select a relative or a friend to fill a particular vacancy.

16. This type of recruitment evidently has a number of shortcomings. The person hired may not be qualified to collect the data and may provide data of questionable value. If the person is not qualified, it may also be very difficult to replace him if he is a relative or friend of a high-ranking official in the CPI programme.

17. Conversely, in countries with dynamic economies that are growing rapidly, it sometimes is difficult to retain data collectors. The wages paid to data collectors are limited by the budgets available for the programme, and it is not uncommon for a statistical agency to pay them less-than-competitive wages.

#### **Training of data collectors**

18. Once data collectors have been hired, it is important that the new recruits be taught how to collect data. The training should cover all aspects of the data collection process as well as how this process contributes to the final product. Suitable tests should be designed to verify the students' understanding of the material and to identify areas where the training needs improvement. Testing must be an integral part of the training.

19. Data collectors must have a thorough knowledge of the processing and coding of all items on the schedule; a reasonably good understanding is not sufficient. A data collector must know all aspects of the schedule and be able to complete it accurately. The training course should teach data collectors how to interview the respondents in a manner that will elicit accurate responses. They must be taught to use their minds when completing the schedule. Examples of how a data collector may identify inconsistencies in a respondent's answers should be provided, as well as tactful ways to clarify these inconsistencies with additional questions.

20. In many countries, the respondent may provide answers which he thinks the data collector wants to hear, especially if he is illiterate or poorly educated. Data collectors must be taught how to interpret the nuances of a respondent's answer and be able to probe with additional questions to obtain an accurate response. Another problem is that some data collectors are overly impressed with the responsibility and authority that they have and become arrogant with respondents. This is obviously not an effective way to

elicit accurate responses and may in the end cause an outlet to cease cooperation.

21. Data collectors and those reviewing the data sometimes assume that their function is not just to collect data, but to collect data that is useful to the government. Prices which have risen sharply and which might conflict with a government's efforts to keep inflation under control, might not only be verified, which is certainly legitimate, but may also be coded as unusable in that price period. This sometimes occurs and every effort should be made to emphasize the fact that data collectors must collect accurate prices, not just prices which have not risen substantially. A CPI that does not attempt to measure actual price movements is of little value.

22. The only way to be certain that a data collector has a comprehensive knowledge of the data collection process is to give tests following various portions of the training. Data collectors should achieve a passing score on each of the various tests to make certain that the new data collectors are prepared to collect data. As the tests are scored, areas in which further training is necessary can be identified.

23. Role-playing as part of the training is useful to give the new data collectors a better understanding of how to conduct an interview. It also allows them to anticipate the types of questions and responses they will receive in an actual interview situation. Trainers can give constructive criticism following the role-playing. When the training is completed, new data collectors should be accompanied by an experienced data collector or a supervisor for a certain period until they are confident that the former can work independently.

24. How long should it take to train new data collectors? "The required length of time for the training is often underestimated for a very simple reason. Teaching students to pass an exam might be considered successful if a high proportion of them achieve a credit mark of say 60 per cent. Teaching enumerators to conduct a survey during which they will be working individually requires that every trainee has a 100 per cent understanding of the methodology and content of the questionnaires. ...Details will vary, but we believe that the training of raw enumerators for most detailed household surveys requires about two weeks." <sup>1</sup> The US Bureau of Labor Statistics' basic course for new data collectors is given over a two-week period. Each country has different requirements, but two weeks seems a reasonable investment in training new data collectors.

#### **Data collector supervisors**

25. When operating on a tight budget, reducing the number of data collector supervisors is sometimes considered a convenient way to cut costs. This is a mistake and may end up costing more in poor data than in realized cost savings. A data collection supervisor plays a key role in the data collection process in a number of ways. He acts as a liaison between the central office and the field; he organizes and oversees the data collection activity; he reviews the incoming data for accuracy and responds to data collector questions; he can conduct follow-up interviews to verify the

accuracy of the collected data; and can fill in for a data collector who is absent. Although an intermittent data collector supervisor is sometimes used, he cannot fulfil all the duties of a full-time, on-site supervisor.

26. When possible, a supervisor should be selected from the ranks of the experienced data collectors in a PSU. Such a person already has experience in collecting data and may know well the idiosyncrasies of the existing sample of outlets. He can give guidance to other data collectors, organize the data collection activities in a fair manner and provide on-the-job training to the newer data collectors. Another alternative is to select as a supervisor someone from the central office who is familiar with the data collection activities and who comes from that PSU or region.

27. In implementing a quality assurance programme, it may be useful for data collection supervisors to make quality assurance checks on the data collectors. If they are full-time, on-site supervisors, they can conduct these checks as part of their supervisory duties.

#### **Retention and morale of data collectors**

28. While it may be possible to hire very competent data collectors, one continuing problem in many countries is the ability to retain them. In some countries, poor pay and the availability of other attractive and better-paying positions makes this extremely difficult. In other countries, data collectors are taken for granted and are rarely recognized for the important contribution they make. Conducting a large, continuous survey requires a number of experienced data collectors. The effectiveness of the programme suffers when there is high turnover of data collectors and the continuing task of recruiting and training new ones is a drain on limited resources.

29. If the morale of data collectors can be enhanced, better data collection frequently results. One way to achieve this is simply to involve data collectors in improving price collection aspects. Improvements can be in many different ways, whether by simplifying the pricing schedule or by distributing more efficiently the pricing workload to achieve a better balance between data collectors.

30. Not all programme changes are greeted warmly by data collectors, however. In some instances, it may be necessary to improve the pricing procedures by making methodological changes that make data collection more difficult. Consulting the data collectors on a continuous basis means that they are better able to understand the problems in the central office and be more compliant when changes have to be introduced.

31. As a CPI programme matures and refinements are made in the pricing methodology and in the editing and processing of the data, changes occur in the type and manner of data collection. Another way to clearly demonstrate how highly data collectors are valued, and at the same time increase their effectiveness, is to establish a retraining programme. This also serves to bring them "into the loop" so they have a better understanding of the overall programme objectives and how important their contribution is to the

programme. Retraining should take place whenever the programme has introduced or plans to introduce significant changes in data collection, or at least every other year. Annual retraining could be envisaged if the cost is not too high.

### **Respondent cooperation**

32. Countries which have an ongoing data collection programme and in which the government is regarded with trust and confidence generally receive good cooperation from the respondents. Governments which do not have the trust of the general public fare less well. Respondents are less forthcoming if they fear that the data they provide will be used to raise their taxes or license fees. The data collector must attempt to allay these fears and instill a degree of trust in the respondent.

33. In many countries, the mandate authorizing the collection of price data specifies that these data are protected and are confidential at all times. This confidentiality clause frequently precludes the sharing of price data even with other ministries within a government. The mandate may also specify whether respondent cooperation is obligatory or voluntary. In the United States, the mandate specifies that the collected data are confidential and also stipulates that the respondent's cooperation is voluntary. Although a very high percentage of retail outlet managers or owners willingly cooperate, some refuse for one reason or another. In those instances, the data collector is instructed to indicate the unwillingness of the manager to cooperate and the outlet is dropped from the sample.

34. In Papua New Guinea, the Central Statistical Office had a Branch of Enforcement. Because the data collection mandate in this country required establishments to cooperate with the survey operations, anyone who refused was subject to a court appearance and a fine. While mandatory cooperation may seem to work in the short-term, the data collected may be of questionable value. Resentment by respondents at being forced to cooperate may produce responses that are inaccurate or misleading.

### **Secondary sources of price data**

35. While almost all prices in a CPI are collected directly from the primary seller of the good or service using a data collector, in some instances a secondary source may be used. This may present special data collection problems because the prices are not original and must be verified through the secondary source, which in some instances may be a publication or another type of source.

36. For example, used cars are difficult to price because of the challenge of finding a comparable used-car model from one time period to the next. In the early 1970s, the US Bureau of Labor Statistics collected used-car data from auction books provided by the National Automobile Dealers Association (NADA). The NADA obtained auction quotes for used cars in various regions of the country and, using a sample of a few cars, these NADA prices were extracted each month and calculated for the used-car component of the CPI.

The Bureau of Labor Statistics used these prices because of the difficulty of attempting to price a constant-quality used car over time and because the source was reliable and credible. The auction guides specified for each car the model, make, quality (good, clean, fair) and various options which were included or excluded from the estimated average price.

37. Used-car prices exhibited a very seasonal price pattern, with the lowest prices for a specific used car occurring in the early fall, just before the introduction of the new year's models and just before a one-year old used car became a two-year old used car. Prices in the following month were then at their highest level and gradually fell until spring when, adjusting for seasonality, they would begin to rise to a high point in May or June when demand for used cars was at its highest. One year in the early 1970s, used-car prices rose in the spring, but advanced a little more than was expected. Because of the slightly higher than normal price increase, the used-car prices were reverified by a number of analysts using the NADA auction books and the prices appeared accurate. A few days later, the Bureau of Labor Statistics released that month's CPI.

38. A couple of months later, one of the analysts was planning to buy a used car and was looking at the NADA books for average prices. He noticed that, prior to May, the price of a car with air-conditioning was excluded but, from May onwards, it was included. The NADA had decided that, since the majority of cars at that point were being sold with air-conditioning, it was better to include air-conditioning in the total used-car price and not to list it as an option. This had an impact on one of the most visible indexes the United States publishes, and the Bureau of Labor Statistics was obliged to issue a correction to the CPI.

39. Other secondary sources of information used include those of utility companies, i.e. for electricity, water, and even telephone charges. With the cooperation of the utility company, an average usage cost can be calculated on a monthly basis, and used to calculate this component of a CPI. A utility company may, however, have a conflict of interest in that it may want to show a smaller-than-normal increase to justify its periodic requests for higher rates. So "due diligence" should be practised when using prices from this type of secondary source.

40. A special effort should be made to verify that the prices from a secondary source are accurate. It would be practical to establish a good relationship with secondary sources, so as to educate them as to the importance of their cooperation and of providing information about any changes that might occur in a specification or a specific price. Another alternative in verifying the accuracy of a secondary source would be to take a small sample of households from which prices could be collected directly. If any of the prices changed significantly without a corresponding change indicated by the secondary source, an explanation of the discrepancy could be requested.

### **Timing of price collection**

41. In collecting price data for a CPI, there is a tradeoff between collecting prices over the course of several weeks or collecting prices in one particular week. If prices are collected over several weeks, fewer data collectors are required because they would have more time to collect price data. If prices are collected in one specific week, more data collectors are required for that week, but once they complete their price collections, they are not needed for another month. Unless they have other duties, they are idle for a considerable part of the month. It would probably be difficult to recruit data collectors for just one week per month and maintain the continuity of the data collection programme. In the United States, the Bureau of Labor Statistics collects prices in three different cycles spanning about 26 days of the month.

42. Regardless of the method used, attempts should be made to collect prices at the same time of the month for each item respectively. "In practice, all price observations cannot be made within a single day, let alone at one point in time, so the real issue is whether they are spread over a few days to provide an approximation to a point-in-time estimate or over the whole month to provide a whole-month estimate. However, which of their sampling errors will be greater cannot be established a priori. In either case, items priced once a month should be priced at the same time in each month, so that the interval between observations is the same for all such items." <sup>2</sup>

### **Pricing frequency**

43. The frequency with which prices are collected often varies according to the item being priced. Items which exhibit a low price volatility are usually priced less frequently than those which have sharp price increases or decreases. Because of this, data collection costs can be reduced by establishing a price collection schedule which varies according to the item being priced. Generally, food items and a few other items which display a high degree of volatility are priced each month. Other items, such as durable goods (e.g. refrigerators, freezers, washing machines) or non-durable goods (e.g. clothing) do not exhibit a high degree of volatility and can be priced every other month or, in some cases, even less frequently. Rents tend to change only occasionally. By collecting rents on a semiannual basis, data collectors only have to visit a rental unit once every six months. Similarly, educational fees generally only change at the beginning of a school year.

### **Processing and publication**

44. "Data collection is not an end in itself: unless the data can be processed, analysed, and converted into information in a format that can be assimilated by the users the effort is both pointless and costly. One of the major problems that arises when a continuous survey programme is established

is the preoccupation of the limited professional manpower with the maintenance of the data collection effort at the expense of information production." <sup>1</sup> With the advent of microcomputers, processing the incoming data electronically is becoming the norm in many countries. Designing a data collection form that allows for easy data collection as well as for entering the data electronically will enhance efforts to produce a timely and accurate CPI.

45. In order to process the data effectively, data collectors must know how important it is to collect the prices in a timely manner and to submit these for review to their supervisors. When questions are raised about an item's description or price, there must be enough time to conduct a follow-up visit to clarify any questions and resubmit the price collection schedule for review. Once all prices are collected, they are sent to the main office for processing.

46. Processing can be improved if the price schedules are submitted on a flow basis, rather than all at once. Although setting up the original processing system can be a difficult exercise logistically, once the system is established and working, improvements can be made to speed up the process. In the mid-1980s, using quality assurance techniques, the Bureau of Labor Statistics was able to bring forward the release date for the CPI by six days.

#### **Paperless data collection**

47. With the advent of personal computers, laptops, notebooks and palm-held computers, the potential for collecting data electronically exists and is appealing in comparison with the traditional way of collecting prices using data collection schedules. Rather than having to bring with them price schedules from previous collection periods as well as a specification manual or specifications, data collectors could carry a small, palm-top computer which could show the name of the outlet, the best time to visit, the last person contacted in the outlet, the item to be priced, the description of the item highlighting all of the most important price factors, and the last collected price. The data collector would identify the item and, if its characteristics were unchanged, enter the price. If the item was unavailable and a substitution with a new item was necessary, he could select the next closest item to the previously priced item, enter any changes in the description and enter the price. After all items for that day were priced, he could return home, attach the palm-top to the serial port of his desktop computer or to a modem, and transfer the data electronically to his supervisor's computer at the regional office.

48. After reviewing the data, the supervisor could send the data on to the regional office or to the main office for analysis and further processing. Backup copies would need to be made in case of problems during transmission.

49. In the United States, the Bureau of Labor Statistics began collecting prices for commodities and services in this manner on 1 July 1997.

#### **Data collection and quality adjustments**

50. Adjusting price data for quality changes can frequently present problems. Changes in the size or weights of a specific item can be adjusted arithmetically and present no real problem. However, making adjustments in the price of an item because of changes in its quality presents a far more complex problem. In the United States, a couple of months prior to the introduction of the new models for the coming year, a small team of economists at the Bureau of Labor Statistics makes an annual trip to Detroit, the car manufacturing capital of the United States, to discuss quality changes in the new models. Manufacturers present the team with the quality changes that occurred and provide estimates of the cost of these changes. These changes and estimates are then discussed and, when the new models are introduced into the CPI, quality adjustments are made based largely on the manufacturers' estimates.

51. For other items, making quality adjustments is far more difficult. Obtaining reliable cost estimates from manufacturers is often prohibitive because of the costs involved, especially when an item is produced by multiple manufacturers spread throughout the country or the world. For example, computers have improved in quality while at the same time the price has fallen. With literally hundreds of computer manufacturers, it is impractical to obtain cost estimates of quality changes from each of the manufacturers. The Bureau of Labor Statistics has made estimates of quality changes in some apparel items since 1987 using hedonic methods.

#### **Quality assurance**

52. Unlike efforts to make estimates for the change in quality of certain items, quality assurance attempts to ensure the quality of all of the price data. There are many different methods that can be used but, in essence, an ongoing programme for ensuring the quality of the data must be established.

53. At the US Bureau of Labor Statistics, much of the quality assurance work is conducted by regional supervisors who review a small percentage of a data collector's schedules. By comparing a specific item's description against the specification, the quality assurance inspector can note any deficiencies in the description of the item. The item's price from the current period and previous period are compared. Significant changes in the price of an item are supposed to be explained by the data collector in a footnote, based upon discussions with the store manager. Certain items which are traditionally more difficult to price are reviewed with greater frequency than items which are fairly routine to price.

54. Supervisors should pay especially close attention to data collected by new data collectors who are not experienced with the system. This quality assurance inspection will help the new data collector obtain useful information and improve the quality of their data collection activities. Knowing that their data will be reviewed very carefully by supervisors on a routine basis, data collectors tend to make a greater effort to make sure there are no errors in their data collection procedures. They are also less likely to consider falsifying the data if they know they might have a quality assurance check on the prices they collected. Periodically, the supervisors

revisit outlets and collect prices for the same items and then a schedule-to-schedule comparison is made for accuracy.

55. A quality assurance programme must be a collaborative effort between the regional supervisors and the data collectors. It is not an attempt to try to find fault with the data collectors, but an effort to improve the overall quality of the data being collected as well as to identify areas where retraining would be beneficial. In one country, efforts to start a quality assurance programme met with some resistance. High level officials believed that, to be really effective, it was necessary to carry out quality assurance checks clandestinely. It was decided that one of the branch chiefs in the CPI programme would secretly fly to some of the PSUs in the sample and check on a number of prices collected by the data collectors in that city. The branch chief was recognized in the city, and within a few hours the regional supervisor knew he was visiting outlets in the central market. The result was that, instead of improving the data collection activities and building a sense of trust and cooperation with the data collectors, the regional supervisor and the data collectors felt that they were being spied upon.

56. If both the regional supervisors and the data collectors had been involved in establishing the quality-assurance programme, the chance of success in improving the quality of data would have been greatly enhanced. By revisiting the outlet and collecting the price data shortly after the initial visit, the quality assurance specialist verifies the accuracy of the previously collected data and may identify areas in which the data collectors could benefit from retraining. It is important, though, that this be done in a cooperative manner if it is to be effective.

57. With the advantage of electronically processing the data, "screens" of data can be developed for identifying prices suitable for conducting quality assurance checks. Although the financial or manpower resources are not often available for extensive quality assurance checks each month, a systematic review procedure can be developed so that the output of each data collector can be checked at least once every two or three months. Prices which have shown unusual stability or volatility can be checked. If the price data are keyed along with a code for the relevant data collector, the price collection activities of newer data collectors can be reviewed more frequently than for seasoned data collectors. Items which have been particularly difficult to price can also be reviewed with greater frequency than items which are relatively simple to collect.

### **Summary**

58. Data collection and quality assurance are critical elements in producing a consumer price index. The qualifications and characteristics required for data collectors should be established and applied during recruitment. A thorough training programme for data collectors is essential for high quality data collection. Supervisors help to ensure the proper and accurate collection of price data and can help in implementing a quality assurance programme. Once hired and trained, the data collectors should be retained, and their morale maintained. This may be achieved by involving

them in the programme and by periodically providing them with retraining. Respondent cooperation is essential for obtaining accurate data and good relations should be fostered between data collectors and respondents. Particular care is needed when using secondary sources of prices because the needs of the secondary sources may not always coincide with the needs of the CPI programme. One clear way of improving the quality of the data is to establish an ongoing quality assurance programme.

**Endnotes**

<sup>1</sup> D.J. Casley and D.A. Lury: "Data Collection in Developing Countries", second edition (Clarendon Press, Oxford, 1987).

<sup>2</sup> R. Turvey: "Consumer price indices" (ILO, Geneva, 1989).