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DIRECTORATE FOR EDUCATION
BOARD OF PARTICIPATING COUNTRIES FOR THE PROGRAMME FOR
THE INTERNATIONAL ASSESSMENT OF ADULTS COMPETENCIES

PIAAC TECHNICAL STANDARDS AND GUIDELINES

3rd meeting of PIAAC BPC
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PIAAC TECHNICAL STANDARDS AND GUIDELINES

INTRODUCTION, PURPOSE AND SCOPE OF STANDARDS

1.   PIAAC will establish technical standards and guidelines to ensure that the survey design and implementation process of PIAAC yields high quality and internationally comparable data.

2.   The attached document is a first draft of these technical standards and guidelines that is presented to the PIAAC Board of Participating Countries (BPC) for discussion and finalisation at its next meeting. The document is also presented to PIAAC National Project Managers (NPM) who may wish to provide input to the discussion in the BPC. The document is structured in two parts:

Part I provides an introduction to PIAAC and its objectives as well as the methodologies.

Part II presents the proposed standards, together with their rationale, technical implications, recommendations for implementation and quality assurance procedures.

3.   Members of the BPC should assess the adequacy of the standards and guidelines in meeting the survey objectives, their operationalisation, the feasibility of implementing them at national levels. For example, is the balance which standard 3.7.1 on response rates seeks to strike between setting numeric response rate requirements, on the one hand, and other means to minimise non-response bias optimal? Or are the provisions in standard 4.2 the most effective way to provide flexibility to countries in embedding national survey material in the international instruments, on the one hand, and ensuring international comparability, on the other? These are the kind of questions which the BPC will need to address.

4.   Once adopted, it is essential that all countries follow the standard and guidelines. Where this is not possible, countries may apply for derogations from the standards. All such derogations will require prior approval by the Consortium and applications must be submitted to Consortium at least nine months prior to the planned commencement of data collection in order to ensure that they will have no adverse effect on the objectives that member countries have set for PIAAC collectively. Where derogations would compromise the survey objectives, the Consortium will bring these to the attention of the OECD Secretariat which, in turn, may refer them to the BPC for arbitration.

5.   In addition to the standards, the document also provides recommendations, which are designed to further improve the quality of the survey implementation and results. Inquiries pertaining to the PIAAC standards should be addressed to: *Claudia Tamassia, PIAAC Project Co-ordinator, Educational Testing Service, Telephone: 609-734-1792, E-mail: ctamassia@ets.org.*

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PIAAC TECHNICAL STANDARDS AND GUIDELINES

PART I. OVERVIEW

INTRODUCTION TO PIAAC

1.   The Programme for the International Assessment of Adult Competencies (PIAAC) is a multi-cycle international programme of assessment of adult skills and competencies sponsored by the Organisation for Economic Co-operation and Development (OECD). Governments in OECD countries face the challenge of maintaining competitiveness in a global economy by ensuring that labour markets are flexible and responsive and are open to a wide range of people of all ages.

2.   PIAAC will assess the level and distribution of adult skills across countries, focusing on the cognitive and workplace skills needed for successful participation in the economy and society of the 21st century. PIAAC will collect information on skills required in the workplace, participants'[1] educational backgrounds and professional attainments, and their ability to use information and communications technology. In addition, PIAAC will include an assessment of cognitive skills to measure participants' general levels of literacy and numeracy.

3.   PIAAC has evolved from two previous international literacy surveys: the International Adult Literacy Survey (IALS), conducted between 1994 and 1998, and the Adult Literacy and Lifeskills Survey (ALL), conducted between 2002 and 2006. The 1994 IALS was the first effort to undertake a large-scale assessment of adult literacy skills at the international level. IALS compared the demonstrated literacy skills of people across countries, cultures and languages. Thus, it highlighted the importance of literacy to the economic and social well-being of countries. Twenty-three countries participated in IALS: Australia, Belgium (Flanders), Canada, Chile, the Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Mexico (Nuevo Leon), the Netherlands, New Zealand, Northern Ireland, Norway, Poland, Portugal, Slovenia, Sweden, Switzerland, the United Kingdom, and the United States.

4.   The practical experience gained from the implementation of IALS and from the analysis of the survey results indicated that there was room for improvement in future surveys of this type. In particular, the need was identified to standardise, as much as practically possible, the survey design, survey implementation procedures and estimation methods. ALL therefore sought to improve on IALS by developing standards to ensure that minimum quality assurance goals would be met, sources of survey variability could be minimised and survey results could be compared. Seven countries participated in ALL: Australia, Bermuda, Canada, Hungary, Italy, Korea, Norway, the Netherlands, New Zealand, Switzerland and the United States.

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[1] A participant is a member of the target population, as defined in Section 3.1, and is a completed case, as defined in Standard 3.3.3

5.	With the first round of data collection, PIAAC seeks to ensure continuity with these previous surveys, to extend the concept of literacy and numeracy to problem solving in technology-rich environments and to provide more information about individuals with low levels of competency by assessing reading component skills. The standards developed for PIAAC are based on, and expand upon, the ALL standards.

6.	In PIAAC, as in any survey, it is a challenge to minimise potential survey errors, which may be due to such factors as the sample design, the survey frame, the selection of the sample, the measurement instruments, errors during data collection, data processing problems, weighting and estimation difficulties, and so on. PIAAC has the added complexity of requiring the administration of a psychometric assessment of adult literacy and numeracy in addition to the administration of a questionnaire. Furthermore, in a multi-national survey such as PIAAC, there is the challenge associated with the diversity of cultures, languages and survey-taking practices among participating countries. No single survey design will be effective for every participating country – each country must implement PIAAC in a manner that is appropriate to its population structure and survey-taking realities. Nevertheless, because of the survey complexities and the possibility that different countries will use different survey practices, it is important to standardise, as much as practically possible, the PIAAC survey procedures.

7.	The design and implementation of PIAAC is the responsibility of an international consortium of well-established institutions from North America and Europe led by the Educational Testing Service in the United States. The other partners of this consortium are Westat in the United States; cApStAn in Belgium; the Research Centre for Education and the Labour Market (ROA) at the University of Maastricht in the Netherlands; and the GESIS-ZUMA Centre for Survey Research, the German Institute for International Education Research (DIPF), and the Data Processing Centre of the International Association for the Evaluation of Educational Achievement (IEA) in Germany.

SURVEY OBJECTIVES

8.	The primary objectives of PIAAC are to 1) identify and measure cognitive competencies believed to underlie both personal and societal success, 2) assess the impact of these competencies on social and economic outcomes at individual and aggregate levels, 3) gauge the performance of education and training systems in generating required competencies, and 4) help to clarify the policy levers that could contribute to enhancing competencies.

9.	One of PIAAC's core objectives will be to assess how well participants use information and communications technology to access, manage, integrate and evaluate information; construct new knowledge; and communicate with other people. In addition, PIAAC will collect information on participants' use of key work skills in their jobs, a first for an international study. In this way, PIAAC will offer a far more complete and nuanced picture of the "human capital" on which countries can count as they compete in today's global economy. It will help policy makers assess the effectiveness of education and training systems, both for recent entrants to the labour market and for older people who may need to continue learning new skills throughout their lifetimes.

10.	This precise description of the main objectives of the study will ensure uniformity and consistency in the design and analysis of PIAAC across participating countries. It is important that the participating countries share a set of survey objectives, to facilitate comparisons of survey results between countries. PIAAC assessments and questionnaires will be designed to ensure cross-cultural, cross-national and cross-language validity. All participating countries will adhere to the common technical standards specified in this document when implementing the survey.

METHOD OF DATA COLLECTION

11.   In-person interviews must be used to complete the background questionnaire and to administer the direct assessments (*i.e.* literacy, numeracy, component skills and/or problem solving in technology-rich environments).

12.   In-person interviews or telephone interviews will be used to identify appropriate respondents. A computer-assisted data collection method must be used at all stages of the data collection, including completion of the background questionnaire.

13.   The direct assessments will be available in paper- and computer-based formats. However, they must be administered in the mode specified by the computer system that will be used to collect data for the background questionnaire data.

14.   Proxy responses are not acceptable for the direct assessments.

PART II. STANDARDS

1. ETHICS STANDARDS

Purpose

15.   To ensure that all countries and organisations participating in PIAAC adhere to recognised standards of ethical research practices.

Rationale

16.   Research organisations have a responsibility to survey participants, clients, data collectors and the public to follow ethical principles and practices in the conduct of their work. See the Cross-Cultural Survey Guidelines (http://ccsg.isr.umich.edu/pdf/fullguide061108.pdf) for more discussion of ethical practices in survey research.

Standards, Guidelines and Recommendations

Standard 1.1 Professional standards for scientifically rigorous research must be observed at all stages of the study.

    Guideline 1.1A Clearly and objectively describe PIAAC's major research questions.

    Guideline 1.1B Ensure that a survey is the most appropriate method for answering the research questions.

    Guideline 1.1C Submit all research plans to the appropriate institutional review boards and/or ethics committees for approval.

    Guideline 1.1D Train staff on the importance of ethics and scientific rigor in research involving human subjects. (See Section 8.4.)

    Guideline 1.1E Follow best practices in survey design, data collection and post-survey processing according to the PIAAC standards and guidelines.

    Guideline 1.1F Hire or equip staff involved in design, data collection and analysis with appropriate skills to perform scientifically rigorous research.

    Guideline 1.1G Employ appropriate tools and methods of analysis.

Standard 1.2 Research organisations have a responsibility to survey participants and must protect their human rights.

    Guideline 1.2A Researchers must avoid using practices or methods that may harm, humiliate or seriously mislead survey participants.

Guideline 1.2B Participation in the survey must not impose an undue burden for the respondent.

Researchers must take care not to collect information that is already available or that could be obtained by another means.
Researchers must ensure that each question in the survey addresses a specific measurement goal and must not collect new data unnecessarily.

Researchers must balance the need for information against the effort that is required to complete additional survey questions.

Interviewers must make every effort to facilitate the data collection process for the respondent.

Interviewers must ask questions and administer the assessment in such a way that it is easy and comfortable for a respondent to answer.

Guideline 1.2C Survey institutes in each country must ensure that each respondent receives sufficient information and opportunity to give informed consent prior to participation in the survey.

Participants must be provided with information on the following basic study elements, delivered either in the form of advance materials or in person by the interviewer. (See Section 9.2.)

- Sponsor, purpose and duration of research

- Explanation of how the respondent was selected for the study

- Interview procedures to be followed by the respondent

- Voluntary nature of participation

- Expected risks and benefits

- Compensation (if included)

- Maintenance of confidentiality

- Right to withdraw from the study at any time without penalty

- Whom to call with questions

Interviewers must be able to thoroughly and accurately describe the purpose and nature of the study, including participant requirements and anticipated risks and benefits, and respond to any respondent queries.

Guideline 1.2D Researchers must respect the free will and privacy of respondents.

While interviewers should attempt to avoid and convert respondent refusals, they must not allow these practices to approach harassment. (See Section 9.5.)

Interviewers must obtain permission from respondents before using any electronic devices, such as the use of tape recorders for quality control.

Guideline 1.2E The country's survey institute must maintain confidentiality of respondent data. (See Chapter 13.)

All PIAAC staff must sign a pledge of confidentiality and a non-disclosure form. (See Section 13.4.)

Survey participants must be assured that information provided in confidence will not be used outside the stated purposes of the study.

All PIAAC staff must maintain the security of data while it is stored on interviewer laptop computers, as well as during transmission, analysis and reporting.

All PIAAC staff must be careful not to reveal information that uniquely identifies respondents in non-secure communication or reports.

Guideline 1.2F Interviewers must be sensitive to social and cultural differences when contacting respondents and conducting the interview.

Local customs must be observed in planning for and conducting the interview.

Study materials must be presented in a manner that can be understood by the respondent.

Cultural norms must be observed when assigning interviewers to sample cases.

Cultural traditions and norms must be considered when deciding whether to offer respondent incentives and determining what type of incentives would be most appropriate. (See Sections 3.8 and 9.5.)

Standard 1.3 Researchers have a responsibility to conduct work as agreed upon and to maintain all proprietary information in a confidential manner.

Standard 1.4 Researchers must not ask data collectors to engage in any activity that does not follow the principles specified in this chapter with regard to study participants, clients and the public.

Standard 1.5 Researchers have a responsibility to the public to ensure that findings released are an accurate portrayal of survey data.

Guideline 1.5A Researchers must be clear and honest when interpreting and reporting data.

Guideline 1.5B Researchers must account for all data collected and describe the sample design. All inadequacies of the data from all data sources must be reported. Researchers must report all data cleaning and screening procedures used, including any imputation.

Guideline 1.5C Results must be reported accurately, even if they are not the anticipated or desired results.

Guideline 1.5D Researchers must not place undue confidence in any conclusions drawn based upon the data collected.

Guideline 1.5E Researchers must not condone unethical, incompetent or careless practices conducted during any aspect of the survey process.

Guideline 1.5F If an error is discovered after the publication of results, researchers must 1) make an effort to correct the error using an erratum document that describes the error and its impact on study results and 2) provide an additional variable or other means by which analysts can identify the corrected value, along with appropriate documentation. Researchers must report errors to OECD and the PIAAC Consortium.

Guideline 1.5G Researchers must understand the sampling methods used. The fact that a process is automated does not ensure its correctness or appropriateness. Beginning in the planning stage, a competent survey practitioner is needed to ensure that the sampling methods are understood and applied appropriately.

Standard 1.6 Materials and procedures related to the ethical conduct of the study and ethics committee reviews must be documented.

Guideline 1.6 Researchers must maintain a copy of the following documents:

- Scripts, letters, fact sheets and any other materials provided to give respondents information they need to make an informed decision about participation.

- Consent protocols.

- Confidentiality procedures and protocols.

- Affidavits of confidentiality completed by staff (see Section 13.4).

- Records of completion of any specialised staff training on ethics.

- Ethics review committee submissions and correspondence.

Quality Control Procedures

17.	As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to report their methods and procedures for adhering to ethical research standards. (See Section 2.3.)

18.	During the survey planning and data collection period, countries will be required, as part of the Survey Operations National Monitoring Report, to report their methods and procedures for adhering to ethical research standards for the field test and the main study. (See Section 2.3.)

2. SURVEY PLANNING STANDARDS

2.1 QUALIFICATIONS OF NATIONAL PROJECT MANAGER

Purpose

19.   To ensure that the National Project Manager (NPM) possesses the necessary skills and experience to fulfil the PIAAC responsibilities outlined below.

Rationale

20.   Each participating country will appoint an NPM to take responsibility for implementing PIAAC at the national level. The NPM has overall responsibility for ensuring that all required tasks are carried out on schedule and in accordance with the specified international standards. A well-qualified NPM will facilitate the conduct of PIAAC.

Standards, Guidelines and Recommendations

Standard 2.1.1 The position of NPM will ideally involve a full-time contract under stable conditions, to ensure continuity of activities over time.

    Guideline 2.1.1A The NPM must be able to commit a significant amount of his/her time to PIAAC.

    Guideline 2.1.1B If the NPM does not work full time on PIAAC, s/he must employ full-time senior staff in key positions such as operations and data management.

Standard 2.1.2 A person appointed to the NPM position should have experience in planning, organising and conducting large-scale surveys.

    Guideline 2.1.2A Essential skills for the NPM position include the ability to identify, select and manage a team of project staff, together with the experience and competence to handle multiple tasks that may require attention simultaneously.

    Guideline 2.1.2B Previous work in the fields of adult literacy, education, educational assessment and household surveys would be very beneficial, as would familiarity with data processing, survey quality control procedures and data file structures.

    Guideline 2.1.2C The NPM must possess excellent oral and written communication skills in the local language, as well as in English. The NPM will need sufficient linguistic knowledge and confidence to represent the participating country at international meetings where all aspects of the project will be discussed in English, the official communication language of PIAAC.

Standard 2.1.3 The NPM will undertake or supervise all tasks related to the development and implementation of PIAAC in his/her country.

Guideline 2.1.3A The NPM must hire or confirm the leading survey institute responsible for implementing PIAAC. (See Section 2.2)

Guideline 2.1.3B The NPM is responsible for organising the following committees and meetings:

- A national committee composed of leading professionals in the fields of survey operations, research, sampling, education and adult competencies to offer advice to the project and ensure that national views are represented. This committee should reflect the views of the agency responsible for PIAAC, as well as other government agencies and teaching and research institutions. This national committee should meet at regular intervals to review progress, procedures and results throughout the project.

- Groups of national subject area experts to contribute to the development of questionnaire and assessment materials. The NPM is responsible for 1) arranging meetings of these groups to prepare the country's official response to the materials reviewed and 2) setting up structures and opportunities for communication between the national subject area experts and members of the Subject Matter Expert Groups who will guide the international development of the PIAAC framework and instruments.

Guideline 2.1.3C The NPM must attend up to two annual NPM meetings convened for three main purposes: 1) to provide a forum for national representatives to review, comment on and ratify proposals presented by the PIAAC Consortium relating to assessment frameworks and instruments, indicators, sampling requirements, survey administration, data confidentiality, monitoring and quality control plans, status reports, and dissemination of results; 2) to provide training for NPMs on instruments, sampling tasks, operational procedures, response rates, scoring and coding, data preparation, data cleaning, and delivery tasks; and 3) to brief NPMs on data analyses and report preparation at the national and international levels.

Guideline 2.1.3D The NPM is responsible for the following communication and reporting activities:

- Communicate the country's official position on a range of aspects of the project, both to the PIAAC Consortium and at NPM meetings.

- Interact with the PIAAC Consortium and other international committees as needed.

- Prepare reports on the preparation and implementation stages of the field test and main study, including detailed reports of sampling plans, adaptation and translation of survey instruments, development of training protocols and manuals, quality control features, scoring reports, and the overall conduct and progress of data collection.

- Monitor and utilise the PIAAC website for communications on all project-related activities.

- Prepare pre- and post-survey press releases for local media.

- Prepare summaries of data file layouts and country-specific additions to coding schemes.

- Prepare reports documenting scoring activities.

- Prepare reports documenting data cleaning and verification steps.

- Prepare and tailor PIAAC outreach materials for promoting the project and liaise with local media, if appropriate.

- Conduct national analyses, both for data checking purposes and for preparation of national and international reports.

- Review draft international reports.

- Co-ordinate the preparation of national reports of results and documentation of procedures.

Guideline 2.1.3E The NPM is responsible for the following test development activities:

- Review questionnaires and cognitive instruments for accuracy of information, national interest and functionality.

- Co-ordinate submission of new items for the cognitive instrument in one of the six acceptable languages (English, French, Spanish, German, Japanese and Italian).

- Co-ordinate submission of new background questionnaire items in one of the six acceptable languages (English, French, Spanish, German, Japanese and Italian) or adapt existing questionnaire items to meet national interest.

Guideline 2.1.3F The NPM is responsible for the following translation and adaptation activities:

- Monitor and co-ordinate the translation and adaptation of instruments and supporting materials according to international specifications.

- Document proposed changes to instruments and supporting materials for further verification.

- Communicate with the PIACC Consortium on translation and adaptation issues.

- Organise translation of all training and operational manuals as needed.

Guideline 2.1.3G The NPM is responsible for the following sampling activities:

- Monitor the sample design and selection process according to detailed specifications.

- If a country chooses to conduct the weighting step, monitor the weighting process according to detailed specifications.

- Monitor the nonresponse bias analysis according to detailed specifications.

Guideline 2.1.3H The NPM is responsible for the following survey operations activities:

- Monitor the production, dispatch and receipt of materials to and from interviewers.

- Ensure that procedures for administering the questionnaires and cognitive instruments are thoroughly understood by the field supervisors and interviewers who will be involved in the administration of PIAAC.

- Conduct training sessions for supervisors and interviewers employed on the survey (*i.e.* approve data collector training materials and monitor the quality of data collector training).

Supervise training of scorers and monitor all scoring and coding operations according to international requirements.

- Explain data entry procedures and supervise data entry operations.

Guideline 2.1.3I The NPM is responsible for the following quality control activities:
- Ensure quality control throughout survey implementation through prescribed monitoring, verification and reporting activities.

Guideline 2.1.3J The NPM is responsible for the following data file preparation activities:

- Communicate data entry procedures and supervise data entry operations.

- Carry out validation checks of data from the survey instruments, following PIAAC guidelines.

- Organise the dispatch of data files to the PIAAC Consortium.

- Respond to data queries in a timely fashion.

Guideline 2.1.3K The NPM is responsible for the following data product activities:

- Attend secondary analysis training workshops to understand PIAAC analysis methodologies and to develop expertise in the appropriate use of PIAAC data products.

- Participate in the review and validation of results generated using PIAAC data products.

- Respond to national inquiries on PIAAC data management, data analysis and data summarisation methodologies.

Recommendation 2.1.3 Because PIAAC involves computer-assisted delivery of instruments, NPMs must perform significant activities related to systems integration and operation. Each NPM should appoint an information technology co-ordinator, who will have direct responsibility for the following activities:

- Obtain sufficient laptop computers to support survey operations. These computers must meet the minimum technical requirements established by the PIAAC Consortium and should be dedicated to the PIAAC project during the field test and main study.

- Configure these laptop computers with survey software to PIAAC Consortium specifications.

- Train interviewers in the operation of the laptop computers and the survey software.

- Along with the NPM and related staff, receive training on the survey software, including a hypertext builder that can be used to author items for the background questionnaire and cognitive instruments.

- Operate a national helpdesk to provide technical support for the interviewers.

- Extract survey data from laptop computers and manage the formatting and cleaning of the data for delivery to the PIAAC Consortium.

Quality Control Procedures

28.   Countries must provide the NPM's name, qualifications and project time commitment to the PIAAC Consortium as part of the National Survey Design and Planning Report process. (See Section 2.3.)

2.2 QUALIFICATIONS OF THE SURVEY INSTITUTE

Purpose

29.   To ensure that the leading survey institute selected by each participating country has the necessary qualifications and practical experience to conduct PIAAC.

Rationale

30.   To ensure survey quality, the survey institute must have expertise and qualifications specific to the design and implementation of large-scale international surveys. If there is collaboration between different institutes, at a minimum the leading survey institute must have qualifications in collaborating with other national and international institutes so that expertise in the relevant areas is available.

31.   In addition, as PIAAC progresses, key survey institute staff will acquire considerable knowledge and expertise related to the survey. The loss of these staff could jeopardise the quality of a country's collected data. Survey institutes should make every reasonable effort to employ these staff for the duration of PIAAC.

Standards, Guidelines and Recommendations

Standard 2.2.1 Each participating country will identify the leading survey institute responsible for the design and implementation of PIAAC.

Guideline 2.2.1A A country's survey institute will have the following qualifications:

- experience in collaborating with other institutes/organisations/agencies within its own country as well as in other countries;
- successful completion of at least two national probability surveys, each with a sample size of several thousand (ideally, 4 500 to 5 000 completed interviews).

Guideline 2.2.1B The survey institute will possess substantial practical experience in the following areas:

- Survey management.

- Probability sample design and sample selection.

- In-person household data collection.

- Computer-assisted personal interviewing (CAPI).

- Instrument and materials translation/adaptation.

- Interviewer training.

- Achievement of high response rates on household surveys.

- Maintenance of data confidentiality.

- Data processing, including data capture, coding and editing.

- Sample weighting and estimation.

Guideline 2.2.1C The survey institute must establish a project team to carry out PIAAC. If the survey institute does not possess expertise or experience in all the activities necessary to conduct the survey, it may engage the services of other organisations or individuals to obtain the necessary expertise or experience. Consequently, a country's PIAAC project team shall consist of individuals, either from the survey institute or from other sources, whose combined expertise and experience constitute the essential skills and knowledge in the areas outlined in this section of the standards and guidelines.

Recommendation 2.2.1A When selecting the survey institute, countries should consider the following:

- Ability to conform to the technical specifications for the implementation of PIAAC.

- Experience in conducting nationally representative surveys of households.

- Experience in carrying out tests of literacy or surveys involving the administration of assessments.

- Ability to achieve desired response rates, as demonstrated in previous relevant surveys.

- Experience in briefing and training interviewers.

- Mechanisms to ensure high-quality data coding and preparation.

- Demonstrated ability to adhere to timelines and schedules.

- Experience with CAPI methods.

- Value for money.

- Economic and financial strength of the organisation.

Recommendation 2.2.1B Each participating country should review the qualifications of the organisation selected, to determine its merits and adherence to the standards. Adaptations or deviations from the standards may be possible if the organisation will be able to achieve the overall quality objectives of PIAAC. The qualification data should include the following:

- A capability statement providing information on corporate experience in conducting surveys similar in size and scope to PIAAC, including description of survey content, name of sponsor, sample size, field staff requirements, use of computer-assisted interviews and response rates achieved; and

- Qualifications of key personnel to be employed.

Standard 2.2.2 A country's survey institute must appoint key personnel on its PIAAC project team,.

Guideline 2.2.2A A project director will be responsible for the overall management of the PIAAC project within the participating country.

Guideline 2.2.2B A senior survey statistician will be responsible for the participating country's sample design and implementation, weighting (if the country chooses to conduct the weighting step), and regular data analysis.

Guideline 2.2.2C A field director will be responsible for the hiring, training, monitoring and control of data collection staff such as interviewers and field supervisors; implementation of data collection procedures to minimise both unit[2] and item nonresponse;[3] and employment of a sufficient number of interviewers to conduct more than 5 000 interviews within the PIAAC data collection timeframe.

Guideline 2.2.2D A scoring supervisor and scoring staff will score the paper-and-pencil version of the assessment.

Guideline 2.2.2E An information technology manager will be responsible for the set up and maintenance of the computer system for delivering the PIAAC instruments, integration of that system with the organisation's field management system, support for data collection activities, and final data delivery.

Guideline 2.2.2F A data processing manager will be responsible for data capture, coding, and editing and for tabulation of survey results.

Quality Control Procedures

32.   Each participating country will identify to the PIAAC Consortium the survey institute responsible for all aspects of the design and implementation of PIAAC as soon as possible after the initiation of the project.

33.   Each country will provide the PIAAC Consortium with a capability statement for the survey institute that includes the following:

- Information on corporate experience in conducting surveys similar in size and scope to PIAAC, including description of survey content, name of sponsor, sample size, field staff requirements, use of computer-assisted interviews and response rates achieved; and

- Qualifications of key persons to be employed on the country's project team.

2.3 COUNTRY PLANNING REPORTS

Purpose

34.   To provide the PIAAC Consortium with details, in a standardised format, regarding each country's proposed implementation of PIAAC.

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[2] Unit nonresponse is failure of an eligible sample unit to participate in the survey.

[3] Item nonresponse is a missing response to a specific survey question.

Rationale

35.   Each country will produce two planning reports in preparation for the field test and the main study. The National Survey Design and Planning Report (NSDPR) for the main study is intended to provide a detailed description of the final survey design so the PIAAC Consortium can assess the appropriateness of the plan. The NSDPR for the field test will follow the same outline (see Annex 2-1) as the main study NSDPR but will cover only those topics applicable to the field test design and implementation.

36.   The PIAAC Consortium will review the planning reports to determine whether the survey requirements have been satisfied. To ensure comparability of the PIAAC results across participating countries, it is important that each country's survey design plan is consistent with the PIAAC objectives and standards, is methodologically sound, and is operationally practical. The review of the NSDPR will also give the PIAAC Consortium an advance opportunity to detect potential problems with a country's survey design plan and to provide advice on dealing with these issues.

Standards, Guidelines and Recommendations

Standard 2.3.1 At least nine months before the commencement of field test data collection, each country will submit to the PIAAC Consortium an NSDPR for the main study and the field test. The reports must specify the rationale for any deviations from the PIAAC standards. (See Annex 2-1 outline.)

Standard 2.3.2 Countries will submit a second, final NSDPR to the PIAAC Consortium nine months prior to the main study. This document must reflect any design and implementation changes resulting from the field test experience. This report must also specify the rationale for any deviations from the PIAAC standards. (See Annex 2-1 outline.)

Quality Control Procedures

37.   The PIAAC Consortium will review each country's field test and main study NSDPR before the field test to ensure that the proposed plans are methodologically sound and satisfy PIAAC standards. The PIAAC Consortium will provide feedback regarding the acceptability of the preliminary plans. Any concerns will be communicated to the countries.

38.   The PIAAC Consortium will review each country's revised NSDPR before the PIAAC main study and will follow the same quality assurance protocol specified above.

2.4 FIELD TEST

Purpose

39.   To provide data that can be used to inform the evaluation of all key aspects of PIAAC: the assessment and questionnaire items, modes of administration, translations, sample design and selection, data collection procedures, data capture and scoring, and data processing and delivery.

Rationale

40.   The field test will give participating countries experience with instrument administration, sample selection, and overall data collection and post-data collection activities. It will provide empirical evidence for assessing all major PIAAC components and activities before the main study. The overall performance of items from the background questionnaire, assessment, and national and international options will be

evaluated; that is, items that do not appear to be performing as expected will be examined and either revised or replaced. Errors that may have occurred during item translation and adaptation also will be corrected.

Standards, Guidelines and Recommendations

Standard 2.4.1 Each participating country must conduct a field test, prior to the PIAAC main study.

Guideline 2.4.1A Because this is the first round of PIAAC, the field test will, to the extent possible, serve as a dress rehearsal of all aspects of the main study.

Guideline 2.4.1B The field test will be conducted with the same target population as the main study in each participating country.

Guideline 2.4.1C All assessment and questionnaire items, including instrument translation and adaptation, will be evaluated.

Guideline 2.4.1D All survey sampling activities, including sample design and selection, will be evaluated.

Guideline 2.4.1E The field test sample will consist of a minimum of 1 200 to 1 500 respondents per national language version per country. (See Section 4.6 for minimum sample size requirements for various direct assessment options.)

Guideline 2.4.1F All survey operational procedures, including interviewer training and interview administration, will be assessed.

Guideline 2.4.1G The field test will be conducted in households to test the administration of the instruments in a household setting.

Guideline 2.4.1H Quality control forms and procedures will be developed and tested.

Guideline 2.4.1I The field test will be used to evaluate scoring procedures, including scoring standards and scorer training for paper-based instruments and automated scoring procedures for the computer-based instruments.

Guideline 2.4.1J Data capture, data processing, data delivery and data reporting activities will be evaluated.

Guideline 2.4.1K At the conclusion of the field test, each country will collect information from interviewers about the issues they encountered during data collection. A country may choose to send a questionnaire to all interviewers for this purpose, but it also should select a group of interviewers to debrief in person or by telephone.

Guideline 2.4.1L Each country will develop a final field test report, based on an outline provided by the PIAAC Consortium. (See Chapter 17.)

Quality Control Procedures

41.   The PIAAC Consortium will review each country's National Survey Design and Planning Report before the field test and provide feedback as appropriate.

42.   During the survey planning and data collection period for the field test, countries will be required, as part of the National Monitoring Report, to report on the status of all of the various survey activities, just as they will during the main study.

43.   Each country must report the results of the interviewer debriefing to the PIAAC Consortium.

3. SAMPLE DESIGN STANDARDS

3.1 TARGET POPULATION

Purpose

44.   To ensure that the target population for PIAAC is clearly defined in each country and is consistent across the countries.

Rationale

45.   A clear and precise definition of the target population is necessary to ensure that adequate steps are taken to accurately cover the population(s) of interest in the sampling process in each participating country.

Standards, Guidelines and Recommendations

Standard 3.1.1 The core PIAAC target population consists of all non-institutionalised adults between the ages of 16 and 65 (inclusive) residing in the country at the time of data collection. Adults are to be included regardless of citizenship, legal status, nationality or language.

Guideline 3.1.1A The target population excludes adults in institutional collective dwelling units[4] (or group quarters) such as prisons, hospitals and nursing homes, as well as adults residing in military barracks and military bases. Full-time and part-time members of the military who do not reside in military barracks or military bases are, however, included in the target population. Adults in other non-institutional collective dwelling units (or group quarters), such as workers' quarters or halfway homes, are also included in the target population.

Guideline 3.1.1B The target population includes adults living at school in student group quarters, such as a dormitory, fraternity or sorority. Refer to Recommendation 3.4.1 for suggestions on sampling such adults.

Guideline 3.1.1C Age is defined as age at the time of the interview. For surveys with a screener stage, age is determined at the screener level.

Guideline 3.1.1D Adults who are unable to complete the assessment because of a hearing impairment, blindness/visual impairment or physical disability are considered to be out of scope for PIAAC, because the assessment does not accommodate such situations. (See Section 9.7 on disposition codes.)

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[4] Collective dwelling units, or group quarters, are ones in which unrelated residents live in a communal arrangement or in a building that is of an institutional or commercial nature. It is a building where the occupants live collectively for disciplinary, health, custodial work or other reasons. The occupants share facilities with each other to a greater or lesser extent. Group quarters can be institutional or non-institutional. Examples of institutional group quarters are prisons, hospitals and nursing homes. Examples of non-institutional group quarters are college dormitories, halfway homes and workers' quarters.

Recommendation 3.1.1 The target population can be expanded to include additional subpopulations of interest to the country, subject to approval by the PIAAC Consortium. (See Section 3.5 for the standards on country-specific options.)

Quality Control Procedures

46.   As part of the National Survey Design and Planning Report process for the field test and main study, countries will be required to define the target population and any country-specific subpopulations of interest.

3.2 SAMPLING FRAME

Purpose

47.   To ensure that the sampling frame(s) is of high quality, provides acceptable coverage of the target population, and meets the requirements for sampling, location of selected population members, and estimation.

Rationale

48.   The sampling frame is the list from which the sample is selected, and so the quality of the sampling frame affects the quality of the sample. The standards for sampling frames are necessary to minimise coverage error and ensure that adequate information is available for carrying out sampling, data collection, weighting, and nonresponse bias analyses. It is also important that exclusions be clearly specified and limited as much as possible so that no extensive biases are introduced as a result of undercoverage of the population.

Standards, Guidelines and Recommendations

Standard 3.2.1 The sampling frame should include 95% or more of the core PIAAC target population. That is, country-specific exclusions, combined over all stages of sampling, should not exceed 5%.

> **Guideline 3.2.1** Any exclusions to the core PIAAC target population, whether or not they exceed the threshold, must be reviewed and approved by the PIAAC Consortium.

> **Recommendation 3.2.1** Exclusions should be made only because of operational or resource considerations. For instance, countries might wish to exclude persons in hard-to-reach areas. The country should try to identify exclusions before sample selection, to the extent possible.

Standard 3.2.2 The sampling frame at each stage should include any information necessary for sample design, sample selection and estimation purposes. It should include sufficiently reliable information to sample individual units and ultimately to locate individuals for the interview and assessment.

> **Guideline 3.2.2A** The sampling frame(s) must be up to date and must include only one record for each member of the target population. Countries should assess the extent of duplication and the proportion of out-of-scope units on the frame and if necessary, develop a plan to correct these problems. Special care must be taken to eliminate duplicate records in the situation where lists have been combined to create a sampling frame. In addition, countries must evaluate and develop a plan to address any under-coverage in the frame that was not addressed in the documentation of country-specific exclusions.

> **Guideline 3.2.2B** The sampling frame(s) must contain variables for stratification, calculation of measures of size, weighting and nonresponse bias analysis. Variables for stratification and weighting nonresponse adjustments must be available for all records on the frame and must be variables that are correlated with adult literacy, such as age and education.

> **Guideline 3.2.2C** For multi-stage area sample designs where a household registry is not available, listing procedures must be used to develop a frame of households within the selected geographic clusters.

Recommendation 3.2.2A The type of sampling frame(s) will vary by country. While some countries will have a high-quality list of residents or households/addresses corresponding to the target population, other countries will need to construct a sampling frame.

No frame of households or household sampling is necessary if the country has a list of residents that is of sufficient quality. However, some countries' lists of residents might not be complete (*e.g.* the lists may exclude illegal immigrants), complicating their use as a sampling frame. The PIAAC Consortium will decide whether the documentation provided by the countries meets coverage expectations and will follow up on any issue or dispute.

Multi-stage sample designs will require a sampling frame for each stage of selection. For multi-stage area designs, a frame of geographic clusters can be formed by combining adjacent geographic areas, respecting their population sizes and taking into consideration the travel distance for interviewers. The geographic clusters should be formed within states, provinces or other geographic boundaries for which the country wants to create estimates.

Recommendation 3.2.2B Refer to the PIAAC Sampling Plan for more information about household listing procedures used to create local area frames.

Recommendation 3.2.2C To address undercoverage in the local area sampling frame, missed structure and hidden dwelling unit[5] procedures can be implemented, as described in the PIAAC Sampling Plan.

Recommendation 3.2.2D Refer to Section 2.7 of Kish (1965) for more information on frame quality.

Quality Control Procedures

49.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to describe the sampling frame.

50.   During the survey planning period, countries will be required to provide the following information as part of the sampling section of the PIAAC National Monitoring Report:

- Exclusions from the target population, justifications for the exclusions and the exclusion rate.

- Source of the sampling frame(s).

- Date of the last frame update and description of updating procedures.

- Any known frame problems, such as duplicates, out-of-scope units or undercoverage, and plans for addressing these problems.

- Number of records on the frame compared to the target population.

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[5] A dwelling unit (DU) is defined as a room or a group of rooms used, or intended to be used, for living purposes. A DU must be suitable for permanent human habitation and must have:
  1. a private entrance either outside or from a common hall, lobby, vestibule or stairway inside the building. A private entrance is one that can be used without passing through the living quarters of someone else.
  2. cooking, living, sleeping and sanitary facilities that the occupants of the dwelling do not have to share with any persons other than their own household members.
(Definition from Bermuda's Adult Literacy and Lifeskills Survey)

- Estimates of the frame overcoverage or undercoverage rate.

- Variables on the frame for stratification.

- Variables on the frame for calculating measure of size, if applicable.

- Variables on the frame for weighting adjustments and nonresponse bias analysis.

- Population totals from an independent source, overall and by key frame variables (*e.g.* education).

51.   This information will be used to perform several validity checks, including the following:

- All exclusions from the population will be questioned, even if the exclusions add up to less than the threshold (5%).

- Independent population totals will be compared to frame totals.

- The actual counts of frame units will be compared with expected frame counts at all stages of sampling. A tolerance level will be set, and the country will be questioned about any deviations outside the tolerance boundaries prior to sampling for the subsequent stage.

3.3 SAMPLE SIZE

Purpose

52.   To establish minimum sample size requirements for each country, in order to meet the analysis goals of PIAAC.

Rationale

53.   The minimum sample size required for the field test is based primarily on psychometric considerations. While survey operations play an important role in the field test, psychometric considerations drive the size of the sample that is needed. Without an adequate number of participants responding to each of the field-tested items in each assessed language, the PIAAC Consortium will be unable to evaluate the fit of the item parameters across the languages used in that country. The country, along with the Board of Participating Countries and the Secretariat, will need to be willing to accept the very strong assumption that the item parameters for that country are the same regardless of language. Experience indicates that this assumption is often violated as a result of correctable technical deficiencies (*e.g.* translation errors or scoring inconsistencies), thereby increasing measurement error. The PIAAC Consortium recommends that such compromises not be made during this first cycle of PIAAC, given the need to establish comparability across modes, time and participating countries. The field test provides information on the equivalence of scoring standards and the translation accuracy of both instruments and scoring rubrics. Countries that do not participate in the field test will miss the opportunity to correct errors.

54.   The psychometric requirements for the main study are the same as those for the field test. Adequate sample sizes are needed to establish stable item characteristics for each tested language in a participating country. The achievement of adequate minimum sample sizes for each tested language will also enable the PIAAC Consortium to estimate separate population models. Population modelling is a critical step in obtaining appropriate proficiency values that will be used in describing the distributions of skills in a country and in reporting national and subpopulation data.

Standards, Guidelines and Recommendations

Standard 3.3.1 The minimum sample size requirement for the main study is 5 000 completed cases[6] for each national language tested (or 4 000 if the problem-solving component is not conducted) for the core target population, for a self-weighting (proportional to the population) core design. (See Standard 3.3.3 for the definition of a completed case.) The minimum sample size for the field test is 1 200 to 1 500 completed cases for each national language tested.[7] (See Guideline 2.4.1E.)

> **Guideline 3.3.1A** The overall goal of the sample design for the main study is to obtain a nationally representative sample of the target population in each participating country that is proportional to the population across the country (*i.e.* a self-weighting sample design). For the field test and the main study, countries will have the option to increase the sample size to obtain reliable estimates for groups of special interest (*e.g.* 16- to 29-year-olds) or for geographic regions (*e.g.* states and provinces) or to

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[6] A completed case is a case in which the participant completed the background questionnaire and the Core and Main assessments, as defined in Standard 3.3.3.

[7] The consortium recognizes that this could become a significant financial and operational burden for countries planning to conduct the PIAAC assessment in multiple languages. If this is the case, the countries in question will need to approach the consortium which will work with them to reach a solution that does not seriously compromise their ability to test the PIAAC procedures and the assessment in different languages, and to obtain a nationally representative sample to allow the country to report their data.

extend the age range (*e.g.* 66+). However, the minimum sample size is for a self-weighting design, and any sample size attributable to oversampling, or to subgroups outside of the PIAAC target population, is additional.

Guideline 3.3.1B The PIAAC Consortium recognises that meeting the sample size requirements for multiple languages could become a significant financial and operational burden for a particular country. If this is the case, the PIAAC Consortium will work with the country to reach a solution that does not seriously compromise the country's ability to test PIAAC procedures and conduct the assessment in different languages, and to obtain a nationally representative sample that will allow the country to report its data.

Standard 3.3.2 As part of the National Survey Design and Planning Report process for the field test and the main study, the country must specify sample size goals for each stage of sample selection. The country must also specify its assumptions about nonresponse and ineligibility rates and about design effects.

Guideline 3.3.2A The sample size should be adjusted to account for expected nonresponse. For example, if the overall response rate is expected to be 70%, then an initial sample of 7 143 persons must be selected for the main study. For countries with a screener, sample size goals should be constructed for the screener, to account for ineligibility and screener nonresponse, as well as nonresponse to the background questionnaire and the assessment.

Guideline 3.3.2B Sample size requirements must be increased for countries with highly clustered samples or with a high degree of variation in sampling rates due to either oversampling or variation in household size, if those countries are to retain the same level of precision as other countries. The target sample size should be increased if the design effect due to clustering and differential sampling rates is expected to be greater than 1.5. Refer to the PIAAC Sampling Plan for computational details.

Standard 3.3.3 A completed case is one that contains at least the following:

- Responses to key background questions, including age, gender, highest level of schooling and employment status.

- A completed Core instrument (*i.e.* the interviewer asked the respondent all Core questions or the Core instrument was not completed for a literacy-related reason [*e.g.* because of a language difficulty] or because the respondent was unable to read or write in any of a country's PIAAC official languages).

- At least five completed questions in each block of a Main task instrument, for respondents who passed the Core assessment.

Guideline 3.3.3 Each country must verify that its sample data are consistent with the definition of a complete case. The country must also check disposition codes against available interview data to ensure consistency before delivering the data.

Standard 3.3.4 Assessment instruments must be randomly allocated in a manner that ensures that the minimum number of cases is targeted per task.

Quality Control Procedures

55.   The response rate and ineligibility rate assumptions specified as part of the National Survey Design and Planning Report process for the field test and main study will be reviewed to help ensure that initial sample sizes are large enough to achieve the target sample size.

56.   The PIAAC Consortium will compare the sample data to the PIAAC disposition codes to verify that completed background questionnaires and assessments (as indicated by disposition code) have sufficient data.

3.4 SAMPLE DESIGN

Purpose

57.   To specify the PIAAC sample design that will produce a probability-based sample, representative of the target population, in each participating country.

Rationale

58.   Probability-based scientific sampling is essential for two main reasons. First, probability sampling encompasses a set of designs that leads to a variety of unbiased sampling approaches that allow analysts to generalise the results to the target population. Second, measures of precision related to survey estimates (*i.e.* standard errors, margins of error, confidence intervals) can be computed only under a probability design. Hence, statistical tests for differences between survey estimates are possible only under a probability-based design.

59.   The aim in developing the sample design and the selection process is to achieve the maximum precision possible for a given sample size, while limiting the costs of data collection. The PIAAC core sample design will be a stratified multi-stage clustered area sample. Deviations from the core design are expected because some countries are geographically small, and therefore will have less clustering and fewer stages of sampling. Also, some countries will have lists of households or persons already available from national registries. The general approach will allow for flexibility in the sample design and will be adaptable to each country's best sampling scenario.

Standards, Guidelines and Recommendations

Standard 3.4.1 Each sampled person will have a non-zero probability of selection resulting from the application of established and professionally recognised principles of scientific sampling.

> **Guideline 3.4.1** As the ultimate sampling unit, each person in the PIAAC target population will have a calculable non-zero probability of selection. That is, every in-scope person will have a chance of being selected into the PIAAC sample.

> **Recommendation 3.4.1** Countries should determine how to sample adults living at school in a dormitory, fraternity or sorority. If the country's sample design has a household stage of selection, the PIAAC Consortium recommends sampling such persons through their permanent residence rather than their student group quarters. Under this design, student group quarters should be excluded from the household frame, to ensure that such persons have only one chance of selection. If a college student was selected as a respondent from the sampled household, the data collection contractor would have two options: 1) depending on the location and the availability of nearby staff, attempt to conduct the interview at the student's dormitory or 2) attempt to schedule an interview with the student at the sampled residence, at a time when s/he will be home from college. An alternative approach is to include college dormitories in the sampling frame and select students from sampled dormitories. Under this design, students residing in such dormitories must be excluded from the sampled households.

> For students living in a housing unit while attending school, the housing unit should be considered their permanent residence. A student group quarters is a collective dwelling unit with a shared kitchen in which rooms are paid for through the school, whereas a housing unit is a dwelling unit that contains its own kitchen and for which the student pays a realty company or landlord.

Standard 3.4.2 The sample design at each stage of sampling will be probability based to allow an overall probability of selection to be derived for each person. Hence, non-probability designs, such as quota sampling[8] and the random route approach,[9] are not allowed at any sampling stage.

Guideline 3.4.2A As discussed in Murray, Kirsch and Jenkins (1998), for the random route household selection approach, selection probabilities are not generally known, and therefore the resulting samples are not considered probability samples. Furthermore, random route designs require control of sample selection in the field, and there is concern that the interviewers exert influence on the household selections. Control of the selection process by each country requires detailed instructions for selecting respondents that can be dependably followed by the interviewers.

Guideline 3.4.2B A multi-stage cluster sample is necessary when a complete listing of eligible persons or households is not available. In multi-stage cluster sampling, geographic clusters are formed and selected, giving each cluster a probability of selection. Within sampled clusters, all households are listed and a sample of households is subsequently selected, giving each household a probability of selection. Within selected households, the eligible persons are listed and a sample of persons is selected, giving each eligible person a probability of selection. More information about multi-stage area samples is provided in the PIAAC Sampling Plan.

Recommendation 3.4.2A While cluster sampling reduces interviewer travel costs for in-person visits, it does have an increasing effect on sampling variance. Countries need to evaluate the cost-variance trade-offs of using a cluster sampling design; as an example, Kish (1965) outlines such evaluations.

Recommendation 3.4.2B Stratification is used to reduce the sampling variance associated with the resulting survey estimates. Stratification combines sample units into homogeneous groups and eliminates sampling variability between such groups. To maximise the benefit of stratification, stratification variables should be reliable and related to the survey outcome. Examples of stratifiers related to literacy are geography, urbanicity, education, income, age, language, employment status and gender.

Standard 3.4.3. The core design is a self-weighting design of households (or of persons, for countries with person registries). A self-weighting design is achieved when each sample household (or person) has an equal probability of selection.

Guideline 3.4.3 A self-weighting design is arrived at differently depending on the number of stages of sampling and whether or not one of the stages of selection consists of households.

If there is one stage of sampling, an equal probability selection scheme (*e.g.* simple random sample, systematic sampling from a sorted list or the same sampling rates across strata) will result in a self-weighting sample design.

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[8] Quota sampling is a non-random approach in which data collection stops when a target sample size is reached, even if all sample units have not been fully worked. Therefore, some bias is introduced into the sample because not all sample units were given a chance of selection.

[9] The random route approach is used for selecting households. The general approach is to have a master sample of starting points for each cluster. Then households are selected using a pre-specified list (the 5th household, the 15th household, etc.) and a pre-defined route. Concerns have been raised about the influence that interviewers might have in the implementation of this type of selection scheme for PIAAC.

For household designs with more than one sampling stage, sampling units are selected with probability proportional to size at each stage before the household stage. Then households are selected with a probability assigned to arrive at self-weighting households, as described in Kish (1965).

Recommendation 3.4.3 To arrive at a self-weighting person design, persons would have to be sampled at a constant rate within a household. However, this approach is not preferred, because a portion of single-person households would be eliminated after screening and more persons than necessary would be selected from large households, resulting in a large clustering effect to the extent of the intracluster correlation within households. Therefore, the within-household sample size constraints are that at least one but no more than two persons are to be selected.

Standard 3.4.4 The goal is to select one person per household. Depending on the variability of household size in the country, two persons may have to be selected from large households.

Guideline 3.4.4 Although the goal is to select one person per household, the selection of more than one person per household is preferred for countries with a large variation in household size. The selection approach should attempt to minimise costs, household burden, clustering effects and variability of the sample weights, while retaining full coverage and randomisation within households with unbiased results. The percentage of households with two sample persons should be kept relatively low (10% or less).

Recommendation 3.4.4A An example of a sampling rule that allows for the selection of two sample persons is to select one person in households with three or fewer eligible persons and to select two persons in households with four or more eligible persons. Countries should develop a rule that best fits their country. For example, the cost per screener and per interview/assessment may differ by country and may therefore affect the sampling rules within households. The intracluster correlation within households may differ across countries because of household composition. Therefore, the clustering effects that result from selecting one or two persons at random per household may have more or less impact in some countries than in others. The impact of within-household clustering on variances is reduced for multi-stage sample designs that have substantial variance contributions from prior stages of selection. Also, in general, differential sampling rates cause an increase in variances. For example, due to varying household sizes, a one sample person design will result in differential sampling rates. The impact of the one sample person design will vary by country depending on the distribution of household sizes.

Recommendation 3.4.4B A limit of two sample persons per household is recommended because of the household burden associated with the length of the interview and assessment.

Quality Control Procedures

60.   As part of the National Survey Design and Planning Report process for the field test and the main study, each country will be required to provide details of its country-specific PIAAC sampling plan. The plan will be reviewed for adherence to the above standards prior to approval.

3.5 COUNTRY-SPECIFIC SUPPLEMENTAL SAMPLES

Purpose

61.   To describe potential country-specific supplemental sampling options and their implications for sample size.

Rationale

62.   The target population for PIAAC includes non-institutionalised adults between the ages of 16 and 65. Given the interest in the youth population and its transition from education to work, some countries may be interested in oversampling youth (16- to 29-year-olds, for example). In addition, a country may include oversamples of other subpopulations or include additional subpopulations outside of the standard PIAAC target population (66- to 74-year-olds, for example).

63.   Countries will need to increase the sample size to obtain reliable estimates for groups of special interest beyond the minimum of 5 000 completed cases for the main study core PIAAC sample. (See Section 3.3 on sample size.) Countries that decide to increase their sample size will need to develop and document processes to provide estimates at the regional level or to provide more detailed information about particular demographic groups.

Standards, Guidelines and Recommendations

Standard 3.5.1 Countries have the option to select an oversample of individuals who are within the scope of the PIAAC target population (*e.g.* those aged 16 to 29 or those in geographic regions such as provinces or states).

> **Guideline 3.5.1** The minimum sample size for the core self-weighting design (ages 16-65) is 5 000 completed cases and does not include the sample size associated with oversampling of subgroups. Interested countries should provide a sampling plan for their oversampling options for review and approval by the PIAAC Consortium.

Standard 3.5.2 Countries have the option to select individuals outside the PIAAC target populations (*i.e.* ages 66 and older).

> **Guideline 3.5.2A** The minimum sample size for the core design (ages 16-65) is 5 000 completed cases and does not include the sample sizes associated with any subgroups outside the scope of PIAAC. Interested countries should provide a sampling plan for extending their sampling frame for review and approval by the PIAAC Consortium.

> **Guideline 3.5.2B** If individuals outside the PIAAC target population are included, countries must develop specifications for any necessary augmentation of the sample size to accommodate the analysis requirements for these additional subsamples.

Standard 3.5.3 All activities associated with the design and selection of country-specific samples are the responsibility of the country. The PIAAC Consortium will review the country-specific options to ensure that they do not affect the core sample design in any harmful way (*i.e.* sample yield, response rates, etc). The country-specific samples must adhere to the standards outlined in this document.

Standard 3.5.4 Response rates must exclude cases outside the scope of the core target population for PIAAC.

Guideline 3.5.4 When computing response rates, countries must exclude cases that are outside the scope of the core PIAAC target population. For example, if data are collected for those aged 66 and older, these individuals must be excluded from response rate computations.

Quality Control Procedures

64.   As part of the National Survey Design and Planning Report process for the field test and the main study, each country will be required to outline any special circumstances that deviate from the core target population and sample design. The report must be submitted to the PIAAC Consortium for approval.

3.6. SAMPLE SELECTION

Purpose

65.   To specify procedures for selecting a probability-based sample from the PIAAC target population following the sample design of PIAAC.

Rationale

66.   The samples that are selected at each stage of sampling must be verifiable, *i.e.* the same sample would be selected if the same sampling procedures were used. Errors in sample selection will produce a bias in survey estimates; therefore, the PIAAC Consortium must approve each country's sample design plan and countries must conduct checks at each stage of sample selection.

Standards, Guidelines and Recommendations

Standard 3.6.1 The sampling unit at each stage of selection must be clearly defined.

   Guideline 3.6.1 Units such as dwelling, household and usual residence[10] must be defined clearly by the countries to determine whether or not the sampling unit is in scope for the target population.

   Recommendation 3.6.1 The country-specific census definitions (or national statistical standards) should be consulted where available.

Standard 3.6.2 No substitution of sampling units will be allowed.

   Guideline 3.6.2 Replacement of sampling units at any stage of sampling is not allowed. If the selected person is unavailable, the interview may not be conducted with a non-selected family member, neighbour or anyone else.

Standard 3.6.3 Persons must be selected from within households using a fully enumerated grid of household members.

   Guideline 3.6.3A A full enumeration grid of household members must be completed to allow for a thorough and systematic approach to determining the eligibility of household members. If full enumeration is not used, there is a greater chance of missing eligible household members. Full enumeration also facilitates the collection of specified variables (*e.g.* age and gender) for each person, which can be used in a weighting adjustment for nonresponse.

   Guideline 3.6.3B The "most recent birthday" method (or, similarly, the "next birthday" method) must not be used to select a person from a household. Because a full household enumeration is not conducted using these approaches, no screener data are captured (*e.g.* age and gender) that could be useful for person-level nonresponse adjustment during the weighting process. For the "most recent birthday" approach, the respondent is first asked how many eligible persons are in the household and is then asked which of these respondents had "the most recent birthday." The person with the most recent birthday is selected. In general, the birthday approaches have an inherent lack of correlation between birth month and the eligible-person characteristics of interest; however, if such a correlation exists, it

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[10] The place of usual residence is the geographical place where the enumerated person usually resides. This may be the same as, or different from, the place where s/he was present at the time of the census or his/her legal residence. (UN definition)

will result in a bias in the estimates. Another concern about the birthday approach is that it depends upon how accurately the respondent remembers the birthdays of the household members (90% according to O'Rourke and Blair [1983] and 75% according to Lavrakas and Bauman [1993]). See the Cross-Cultural Survey Guidelines (http://ccsg.isr.umich.edu/pdf/fullguide061108.pdf) for more discussion of the birthday approaches. The authors of the Cross-Cultural Survey Guidelines express concern that the person who is first contacted will be more likely to say that s/he had the most recent birthday or will have the next birthday.

Recommendation 3.6.3 For countries implementing a paper screener, one operational approach is to select one or two persons per household using Kish-style grids (Kish, 1965). Countries using computer-assisted screeners may use Kish-style grids or write computer code to assign random numbers to each eligible person and then select the person(s) associated with the smallest random number(s). To select two persons, the eligible persons should be sorted by age and gender or other screener variables, and then two persons should be selected systematically with a random start. More information about within-household sampling is provided in the PIAAC Sampling Plan.

Standard 3.6.4 The within-household selection procedure will be verified for 10% of each interviewer's completed cases.

Guideline 3.6.4 Refer to Standard 9.9.3 on how to administer the verification procedures.

Standard 3.6.5 Assessment instruments will be randomly pre-assigned to households or persons (depending on the country's sample design) to meet the needs of the psychometric testing.

Guideline 3.6.5 The procedures to assign instruments and tasks will be automated for `those taking both the paper version and the computerised version of the assessment. A random systematic approach will be used to assign assessment task instruments to sampled households (or sampled persons). The assignment should be included in the survey management system. Refer to the PIAAC Sampling Plan for further explanation of the random systematic approach.

Recommendation 3.6.5 Interviewers must always follow the directions that the computer-assisted personal interviewing system provides about which instruments are to be used for each sampled person.

Standard 3.6.6 At the end of each stage of selection, countries will complete a sample selection quality control template to help the PIAAC Consortium verify that the sample selection process was conducted accurately.

Standard 3.6.7 At the end of data collection, each country will provide sample selection data for each sampled unit, including sampling strata, probabilities of selection, ID variables, disposition codes and auxiliary variables for weighting adjustments. (See the Sample Design International File Layout in Annex 3-1.)

Guideline 3.6.7 The sample design file must be adhered to if a country is to stay on schedule for the weighting process. The sample design file consists of all sampled persons and any nonrespondent sampling units (*e.g.* households) from the prior stage. For example, a household design with a screener would require a sample file consisting of all sampled persons and all sampled households that did not select a sampled person through the screener.

Quality Control Procedures

67.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide sample selection plans.

68.   During the survey planning period, countries will be required to provide, as part of the PIAAC National Monitoring Reports, sampling information for each stage of selection, using sampling information templates. The templates will be designed to capture aggregated information that is necessary for verifying that the sample is representative of the target population and that sampling was conducted in an unbiased and randomised way. At each stage, countries will be asked to estimate the total target population within each stratum so that distributions by stratum can be reviewed at each sampling stage. The following information will be collected <u>for each stage of selection</u>:

- A list of variables used for stratification and their categories.

- Procedures used to construct the sampling frame and to stratify and select sampling units.

- The definition of sampling units.

- Data sources used for forming sampling units

- Average, minimum and maximum cluster size.

- List of certainty units,[11] such as large primary sampling units.

- Measure of size for the sampling units, as well as minimum measure of size.

- A description of units collapsed to obtain the minimum measure of size.

- A formula describing the probability of selection for each sampling unit.

- A sample selection worksheet that provides the following details:

   o target population totals for each level of stratification;
   o number of sampling units on the frame for each level of stratification;
   o total measure of size on the frame for each level of stratification;
   o target sample size, or rate, prior to sampling for each stratum;
   o actual sample size for each stratum, for certainty and noncertainty units;
   o weighted sample estimates for each level of stratification, where the weight is equal to the inverse of the overall selection probability for the sampling unit of the current selection stage;
   o listing of the first 100 records on the sampling frame in sort order, with indicators of which units were selected and their measure of size.

69.   When assessment instruments are pre-assigned, a frequency check should be run on the allocation of assessment instrument types to sample units to help verify that the instruments were allocated

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[11] Certainty units are sampling units with a probability of selection equal to 1. This occurs most often when selecting primary sampling units, which are geographic clusters.

appropriately. Also to help verify appropriate instrument allocation, countries will provide a listing showing the instrument assignment for the first 100 sample cases, in the order of sampling.

70.   The actual sampling information provided by the country (such as stratification variables, clusters, sample sizes and stages of sampling) will be checked against the information given at the time of sample design.

3.7 RESPONSE RATES

Purpose

71.   To establish minimum response rate requirements for PIAAC and to provide standard procedures for response rate computation.

Rationale

72.   There is a potential for bias whenever sampled persons who did not participate in the survey have different characteristics than those who did. For some important characteristics, the respondents may be substantially different from those with missing data resulting in biased outcome estimates. The potential for bias is particularly great when response rates are low. The best protection against potential nonresponse bias is to plan and implement field procedures that maintain a high level of cooperation. It is also critical to monitor the distribution of the sample during the data collection to ensure steps are taken to reduce the potential for bias as much as possible (see Section 3.9), and to evaluate the potential for nonresponse bias at the conclusion of the data collection (see Section 16).

73.   The overall response rate goal of 70% accounts for the screener (if applicable), background questionnaire (BQ), job requirements approach (JRA) module, and psychometric assessment. It is important that all countries use the same approach to computing response rates in order to assess the quality of the resulting estimates. All response rate computations must use the same definition of a completed case and the same response rate formulas.

Standards, Guidelines and Recommendations

Standard 3.7.1 A minimum overall response rate of 70% is the goal.

   Guideline 3.7.1A Data from all countries with a minimum response rate of 70% will generally be included in international indicators and reports unless sample monitoring activities (discussed in Section 3.9) and/or nonresponse bias analyses (discussed in Section 16) indicate serious levels of bias in the country data.

   Guideline 3.7.1B Unless problems resulting from response rates of between 50% and 70% are compounded by other factors, results from countries with such response rates will typically be included in international indicators and reports (in which case the OECD Secretariat will prepare for the BPC a specific recommendation on the use and annotation of country results). Deviations from the international standards will, however, be documented in the international reports and publications.

   Guideline 3.7.1C Results from countries with response rates below 50% will not be published unless the country can provide the OECD Secretariat with evidence that the potential bias introduced by the low response rates is unlikely to be greater than the bias under response rates of between 50% and 70%. (See Chapter 16 for standards on evaluating nonresponse bias.) The OECD Secretariat will examine this evidence and prepare a recommendation to the BPC on the use and annotation of the country results. The costs for this examination will be borne by the country and will not be charged to the general PIAAC budget to be paid by all countries.

   Recommendation 3.7.1 The data collection standards in Section 9.5 include ways to help reach the response rate goal. In addition, the PIAAC Consortium is available to consult with countries that experience response rate difficulties.

Standard 3.7.2 Response rates will be computed for the following stages of data collection, using a standard formula:

Screener (only for countries that need to sample households before selecting respondents)

BQ/JRA

Assessment

> **Guideline 3.7.2A** The standard response rate formula shown below uses the disposition codes provided in Section 9.7.
>
> The computations at each stage are hierarchical; that is, they depend on the response status from the previous data collection stage. The formulas below show the numerator and denominator of each response rate computation.
>
> Let C = Completed screeners (01, 02)
> Let HH = All sampled households
> Let I = Known ineligible (19, 22, 26, 28)
> Let U = Unknown eligibility status (04, 05, 17, 20, 21, 24)
> Let K = All dwelling units with known eligibility status (01, 02, 03, 07, 09, 12-16, 19, 22, 26, 28)
>
> The screener response rate consists of completed cases in the numerator and number of eligibles in the denominator.
>
> Screener response rate   = C / {HH - I - U * (I / K)}
> BQ/JRA response rate   = {Completed BQ/JRAs (01)}/{# Sampled persons – BQ/JRA (12, 13, 15, 16, 18, 25)}
> Assessment response rate =
> {Core (07-09, 14, 29) + Main task (01, 07-09, 14)} /
> {Completed BQ/JRAs - (Core (12, 13, 15, 16, 18) or Main task (12, 13, 15, 16, 18)}
>
> Persons with codes equal to 27 (duplicate) for their respective data collection stage must be excluded from their respective response rate calculation.
>
> **Guideline 3.7.2B** For purposes of calculating the BQ/JRA response rate, a completed BQ/JRA is one that contains responses to at least the key background questions: age, gender, highest level of schooling and employment status.
>
> **Recommendation 3.7.2** Refer to Standard 3.3.3 for the definition of a completed case.

Standard 3.7.3 The overall response rate will be computed as the product of the response rates for the stages included in data collection.

> **Guideline 3.7.3** For countries with a screener questionnaire, the overall response rate is the product of the response rates for the screener, BQ/JRA and assessment. For countries without a screener, the overall response rate is the product of the response rates for the BQ/JRA and the assessment.

Standard 3.7.4 All response rates must be weighted by the household base weight, in the case of a screener response rate, and by the person base weight, in the case of a BQ/JRA or assessment response rate.

Guideline 3.7.4 The base weights will account for any oversampling conducted within countries, and therefore weighted response rates will be a comparable measure across countries.

Quality Control Procedures

74.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their planned response rate computations.

75.   During the data collection period, countries will be required to submit, as part of the National Monitoring Report, a weekly progress report showing the number of completed cases, the number of cases worked, response rates and expected yield (refer to Section 3.9 for more details). The report will be reviewed by the PIAAC Consortium so that any concerns can be addressed.

3.8 RESPONDENT INCENTIVES

Purpose

76.   To increase response rates by offering sampled adults some incentive for participating in PIAAC and for attempting the assessment.

Rationale

77.   Respondent incentives have been shown to be effective for improving response rates without affecting the respondent's performance. As a result, the use of incentives can potentially reduce bias in the estimates. See, for example, Mohadjer *et al.* (1997) and Singer (2002). Because the effectiveness of incentives will vary by country, each country should choose what works best for its situation.

Standards, Guidelines and Recommendations

Standard 3.8.1 Each participating country may opt to provide a "modest" incentive to obtain respondent co-operation. , such as a monetary or non-monetary incentive (e.g., pen, notepad, candy, mug, voucher, gift certificate). However, the planned incentive must be approved by the PIAAC Consortium.

Quality Control Procedures

78.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to specify whether or not incentives will be used and, if so, the type of incentives.

3.9 SAMPLE MONITORING

Purpose

79.   To produce a plan for countries to use in monitoring the sample during data collection, to allow timely reaction to any developing shortfalls or other potential for bias in the outcome sample.

Rationale

80.   Close monitoring of the sample is critical to the success of the data collection effort. The sample monitoring process can help countries identify potential shortfalls in the sample, problems in achieving the desired response rate and potential for nonresponse bias in the collected sample. Continuous monitoring of the sample will allow countries to employ procedures to address these problems during data collection, while it is still possible to meet goals associated with sampling and data quality.

Standards, Guidelines and Recommendations

Standard 3.9.1 Each participating country will provide a weekly progress report during data collection. The report must contain the number of cases completed, the number of cases worked, response rates and expected yield.

   Guideline 3.9.1A The report will follow a template provided by the PIAAC Consortium.

   Guideline 3.9.1B Sample monitoring must begin the first week of the data collection process so that potential problems can be identified and corrected as soon as possible.

   Guideline 3.9.1C Response rates must be computed for each data collection stage. (See Section 3.7 for guidelines on response rate calculations.)

   Guideline 3.9.1D Response rates and sample yield must be monitored according to key demographics, such as age and gender. This will help countries to identify potential shortfalls for specific subgroups, which could result in biased estimates.

   Guideline 3.9.1E The distribution of assessment instruments must be monitored to ensure that the assignment will meet the needs of the psychometric testing.

   Recommendation 3.9.1A Toward the end of data collection, after the standard data collection protocol has been exhausted for all cases, a more extensive sample monitoring report can be generated to identify subgroups with low response rates. The subgroups should be formed according to demographic or area-level characteristics believed to be related to literacy. Multivariate techniques, such as a classification tree algorithm, are recommended for this evaluation. To the extent that literacy skills differ among the subgroups, the differential response rates could be an indicator of potential nonresponse bias. The subgroups with low response rates, or areas containing these subgroups, can then be targeted for follow-up efforts to address the potential for nonresponse bias. See, for example, Krenzke, Van de Kerckhove and Mohadjer (2005).

45

Recommendation 3.9.1B To help countries anticipate shortfalls, sample size and response rate projections should be calculated using finalised cases and assumptions for interim cases and cases not yet worked, to predict the results at the end of the data collection period. For example, the projected number of completes can be estimated as:

Projected # completes = Current # completes + (refusal conversion rate) × (# of interim refusals) + (response rate) × (# of other interim and not worked cases)

This simplified formula should be refined based on the country's assumptions about completion rates for each type of interim code.

Quality Control Procedures

81.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their sample monitoring process.

82.   During the data collection period, countries will be required to submit, as part of the National Monitoring Report, the weekly progress report described above. The report will be reviewed by the PIAAC Consortium so that any concerns can be addressed.

ANNEX 3-1 SAMPLE DESIGN INTERNATIONAL FILE LAYOUT

83.   This file includes all sampled persons. In addition, it must include any prior stage without sampled persons (*e.g.* all sampled households in which no sampled persons were selected during administration of the household screener).

84.   This file is a flat ASCII file.

Variable Name	Label	Comments
ID_PERS	Person identification number. This ID matches to other PIAAC databases, including the BQ/JRA data.	Required
ID_HH	Household identification number. This repeats for each person selected within the household. This is blank for one-stage designs.	Required if households are selected
ID_SSU	Second-stage sampling unit identification number. This is blank for one-stage designs.	Required if VARSTRAT and VARUNIT are not supplied
ID_PSU	First-stage sampling unit identification number. This is blank for one-stage designs.	Required if VARSTRAT and VARUNIT are not supplied
ID_OTH	Other unit identification number. This may be useful when an additional stage of sampling is conducted (*e.g.* addresses within second-stage units). This is blank for one-stage designs.	Optional

PROB_PERS	Person probability of selection (within households, if applicable). This is blank for one-stage designs.	Required for multi-stage designs
PROB_HH	Household probability of selection (within prior-stage clusters, if applicable). This is blank for one-stage designs.	Required for multi-stage designs, as appropriate
PROB_SSU	Second-stage sampling unit probability of selection (within prior-stage clusters, if applicable). This is blank for one-stage designs.	Required for multi-stage designs, as appropriate
PROB_PSU	First-stage sampling unit probability of selection. This is blank for one-stage designs.	Required for multi-stage designs; helps determine certainty PSUs for variance estimation
PROB_OTH	Other stage sampling unit probability of selection. This is blank for one-stage designs.	Optional
PROB_OVERALL	Overall probability of selection of the person, as a product of the probabilities of selection for each stage	Required
STRAT_PSU1	Explicit strata used for stratifying PSUs (or persons if one-stage design)	Required if stratification is used
STRAT_PSU2	Explicit strata used for stratifying PSUs (or persons if one-stage design)	Required if stratification and more than one stratifier are used
STRAT_PSU3	Explicit strata used for stratifying PSUs (or persons if one-stage design)	Required if stratification and more than two stratifiers are used
STRAT_SSU1	Explicit strata used for stratifying SSUs	Required if stratification is used
STRAT_SSU2	Explicit strata used for stratifying SSUs	Required if stratification and more than one stratifier are used

STRAT_SSU3	Explicit strata used for stratifying SSUs	Required if stratification and more than two stratifiers are used
SORT_PSU	Sort order for PSU selection (or persons if one-stage design)	Required if VARSTRAT and VARUNIT are not supplied
SORT_SSU	Sort order for SSU selection	Required if VARSTRAT and VARUNIT are not supplied
DISP_SCR	Disposition code for household for screener. This is blank for one-stage designs.	Required for multi-stage designs, as appropriate
DISP_BQ	Disposition code for person for BQ/JRA (or for household for screener)	Required
DISP_CORE	Disposition code for person for Core instrument	Required
DISP_MAIN	Disposition code for person for Main task instrument	Required
NUM_ELIG	Number of eligible persons within the household. This is blank for one-stage designs.	Required for multi-stage designs, as appropriate
NUM_SEL	Number of persons selected within the household. This is blank for one-stage designs.	Required for multi-stage designs, as appropriate
RAKEDIM1	Raking dimension variable 1, must have corresponding control total file	Required
RAKEDIM2	Raking dimension variable 2, must have corresponding control total file	Required if more than one raking dimension
RAKEDIM3	Raking dimension variable 3, must have corresponding control total file	Required if more than two raking dimensions

RAKEDIM4	Raking dimension variable 4, must have corresponding control total file	Required if more than three raking dimensions
RAKEDIM5	Raking dimension variable 5, must have corresponding control total file	Required if more than four raking dimensions
NRVAR_PERS1	Variable 1 to be used for nonresponse adjustment for BQ/JRA, available for both BQ/JRA respondents and nonrespondents	Required
NRVAR_PERS2	Variable 2 to be used for nonresponse adjustment for BQ/JRA, available for both BQ/JRA respondents and nonrespondents	Required if more than one nonresponse adjustment variable
NRVAR_PERS3	Variable 3 to be used for nonresponse adjustment for BQ/JRA, available for both BQ/JRA respondents and nonrespondents	Required if more than two nonresponse adjustment variables
NRVAR_PERS4	Variable 4 to be used for nonresponse adjustment for BQ/JRA, available for both BQ/JRA respondents and nonrespondents	Required if more than three nonresponse adjustment variables
NRVAR_PERS5	Variable 5 to be used for nonresponse adjustment for BQ/JRA, available for both BQ/JRA respondents and nonrespondents	Required if more than four nonresponse adjustment variables
NRVAR_HH1	Variable 1 to be used for nonresponse adjustment for screener, available for both screener respondents and nonrespondents	Required

NRVAR_HH2	Variable 2 to be used for nonresponse adjustment for screener, available for both screener respondents and nonrespondents	Required if more than one nonresponse adjustment variable
NRVAR_HH3	Variable 3 to be used for nonresponse adjustment for screener, available for both screener respondents and nonrespondents	Required if more than two nonresponse adjustment variables
NRVAR_HH4	Variable 4 to be used for nonresponse adjustment for screener, available for both screener respondents and nonrespondents	Required if more than three nonresponse adjustment variables
NRVAR_HH5	Variable 5 to be used for nonresponse adjustment for screener, available for both screener respondents and nonrespondents	Required if more than four nonresponse adjustment variables
VARSTRAT	Variance stratum (optional)	
VARUNIT	Variance unit (optional)	
LANGUAGE	Language of assessment	

BQ, background questionnaire; JRA, job requirements approach module; PSU, primary sampling unit; SSU, secondary sampling unit

REFERENCES

Kish, L. (1965), *Survey Sampling,* John Wiley & Sons, New York.

Krenzke, T., W. Van de Kerckhove and L. Mohadjer (2005), "Identifying and Reducing Nonresponse Bias Throughout the Survey Process," *Proceedings of the Survey Research Methods Section, American Statistical Association*, pp. 3258-3265.

Lavrakas, P.J. and S.L. Bauman (1993), "The Last-Birthday Selection Method and Within-Unit Coverage Problems," *Proceedings of the Survey Research Methods Section, American Statistical Association*, pp. 1107-1112.

Mohadjer, L., M. Berlin, S. Rieger, J. Waksberg, D. Rock, K. Yamamoto, I. Kirsch and A. Kolstad (1997), "The Role of Incentives in Literacy Survey Research," in *Adult Basic Skills: Innovations in Measurement and Policy Analysis,* Hampton Press, Cresskill, NJ.

Murray, T.S., I. Kirsch and L. Jenkins (1998), *Adult Literacy in OECD Countries: Technical Report on the First International Adult Literacy Survey,* NCES 98-053, U.S. Department of Education, Office of Educational Research and Improvement, Washington, DC.

O'Rourke, D. and J. Blair (1983), "Improving Random Respondent Selection in Telephone Surveys," *Journal of Marketing Research*, 20:428-432.

Singer, E. (2002), "The Use of Incentives to Reduce Nonresponse in Household Surveys," in R.M. Groves *et al.* (eds.), *Survey Nonresponse*, Wiley, New York.

4. SURVEY INSTRUMENT STANDARDS

4.1 BACKGROUND QUESTIONNAIRE

Purpose

85.   To ensure that the background questions are relevant to the PIAAC objectives and that these questions and data items are consistent across all participating countries.

Rationale

86.   The background questions must have the same meaning for respondents in all participating countries despite differences in language and culture. A core set of questions with standard concepts and definitions related to the survey objectives is necessary to allow comparability of the survey results between participating countries. Translations and adaptations of these core questions are guided by this overarching goal in order to facilitate the comparability of core concepts and constructs assessed across countries.

Standards, Guidelines and Recommendations

Standard 4.1.1 Each participating country's background questionnaire (BQ) will include the international "core" questions, as well as the corresponding response categories and coding schemes developed by the PIAAC Consortium.

> **Guideline 4.1.1A** The PIAAC Consortium will develop and identify the core questions that each participating country is required to include in its BQ. The PIAAC Consortium will also identify any optional questions that may be included in the BQ at the discretion of each participating country.

> **Guideline 4.1.1B** Translations must preserve the construct in accordance with the guidelines prepared by the PIAAC Consortium.

> **Guideline 4.1.1C** For a few questions and response options, national adaptations are required. Countries will develop these adaptations based on the guidelines of the PIAAC Consortium. These adaptations may concern the wording of questions and responses or the development of country-specific show cards for educational attainment or earnings. Adaptations of this type require approval by the PIAAC Consortium.

Standard 4.1.2 Countries for which the sample design involves the sub-selection of a person within a selected household will require a set of questions, hereafter called screening questions, to identify the target population members within a selected household and to facilitate the random selection of one person within the household.

> **Guideline 4.1.2A** The screening questions may be incorporated into the beginning of the BQ, or a separate screening questionnaire may be used.

Guideline 4.1.2B Administration time for the screening questions under field conditions should not exceed three minutes, to ensure that administration time does not vary significantly between countries using different sets of precursor questions in their adaptations of the BQ.

Quality Control Procedures

87.   The PIAAC Consortium will prepare master versions of all instruments in English.

88.   The PIAAC Consortium will prepare a set of guidelines for translation and adaptation of the survey instruments.

89.   The PIAAC Consortium will review all final national versions of the BQ to verify adherence to the PIAAC-specified design.

90.   Each country must submit a copy of all of its materials to the PIAAC Consortium in each of its PIAAC official languages.

91.   Each participating country will use the Background Questionnaire Adaptation Sheet (BQAS) to specify its BQ adaptation (see Guideline 5.2.1) and will provide the BQAS to the PIAAC Consortium for review and approval. This sheet will include information about

- Any changes to background item text (stem)

- Variation from the recommended response options

- Translation and cultural adaptation of the background item stem and response options

92.   Each participating country will provide a copy of its BQ, in each of its PIAAC official languages, to the PIAAC Consortium for review and approval.

4.2 COUNTRY-SPECIFIC SUPPLEMENTAL BACKGROUND QUESTIONNAIRE ITEMS

Purpose

93.   To ensure that participating countries have the opportunity to include a limited number of items that are relevant to their own policy context.

Rationale

94.   The supplemental items must be compatible with the items in the background questionnaire (BQ) and direct assessment and with the broader aims of the PIAAC project. Because of limitations to the overall assessment time, and to ensure comparability across countries, countries must follow the guidelines below when submitting additional, country-specific items.

Standards, Guidelines and Recommendations

Standard 4.2.1 A participating country may opt to include a limited number of country-specific questions in its BQ, in addition to the required core questions. The total combined duration of all such additional country-specific questions will not exceed five minutes on average.

> **Guideline 4.2.1** A country may include questions in the BQ to satisfy its own specific objectives, provided such questions do not jeopardize the main PIAAC objectives. These country-specific questions should be located such that they have little or no impact on the core questions. Finally, these additional questions must not extend the background interview by more than five minutes on average.

Standard 4.2.2 The subject matter and placement of any country-specific BQ questions must be approved by the PIAAC Consortium.

Standard 4.2.3 If it plans to include country-specific questions, the participating country will prepare a BQ adaptation plan describing how the BQ is to be developed and the rationale and formulation for any country-specific questions.

Quality Control Procedures

95.   The PIAAC Consortium will develop a Background Questionnaire Adaptation Sheet that countries can use to provide detailed information about national translation and adaptation issues. (See Guideline 5.2.1.) This tool will be used to monitor and, if appropriate, approve country-specific additions to the BQ.

4.3 JOB REQUIREMENTS APPROACH MODULE

Purpose

96.	To ensure that the job requirements approach (JRA) module questions are relevant to the PIAAC objectives and that these questions and data items are consistent across all participating countries.

Rationale

97.	The JRA questions must allow for comparability of the survey results between participating countries.

Standards, Guidelines and Recommendations

Standard 4.3.1 For those countries implementing the JRA items, they must be implemented as specified by the PIAAC consortium, including the corresponding categories and coding scheme.

> **Guideline 4.3.1A** The PIAAC Consortium will develop and identify the core questions that each participating country is required to include in the JRA. The PIAAC Consortium will also identify any optional questions that may be included in the JRA at the discretion of each participating country.

> **Guideline 4.3.1B** Translations must preserve the construct in accordance with the guidelines prepared by the PIAAC Consortium.

> **Guideline 4.3.1C** For a few questions and response options, national adaptations are required. Countries will develop these adaptations based on the guidelines of the PIAAC Consortium. These adaptations may concern the wording of questions and responses. Adaptations of this type require approval by the PIAAC Consortium.

Standard 4.3.2 Adaptations should be restricted and should be made in accordance with the guidelines of the PIAAC Consortium (see also Guideline 4.1.1.C)

Quality Control Procedures

98.	Each participating country will provide its JRA module adaptation plan to the PIAAC Consortium for review and approval.

99.	Each participating country will provide a copy of its JRA module, in each of its PIAAC official languages, to the PIAAC Consortium for review and approval.

100.	The PIAAC Consortium will develop a Background Questionnaire Adaptation Sheet that countries can use to provide detailed information about national translation and adaptation issues. (See Guideline 5.2.1.) This tool will be used to monitor and, if appropriate, approve country-specific additions to the JRA.

4.4 ASSESSMENTS

Purpose

101.   To ensure the cross-country equivalence of the instruments used for the direct assessment.

Rationale

102.   The credibility and comparability of the direct measurements in PIAAC depend on the use of common assessment tools by all countries. To minimise variations in respondents' interpretation and perception of the materials, the direct assessment instruments for each country must be consistent with those used by other countries in terms of content, physical appearance and administration of assessment materials.

Standards, Guidelines and Recommendations

Standard 4.4.1 Each participating country will organise the PIAAC direct assessment instruments in the same way as the master English version of the instruments provided by the PIAAC Consortium. Across countries, the instruments must be equivalent in the ordering of the clusters, number of pages, numbering and order of pages, layout of stimulus material and directives, graphics, response format, text format, and print quality or screen display.

> **Guideline 4.4.1A** The graphic elements of each stimulus material must be used as provided. Text layout must follow the pattern of the master layout as far as possible (differences in word, sentence and paragraph length may lead to small deviations from the master). Typefaces should be identical, where possible, but should, at a minimum, have the same characteristics (bolding, italics, serifs and size).

> **Guideline 4.4.1B** Space for responses (number of printed lines or entry boxes) should not vary more than 10% from the space shown in the master, as respondents often use the amount of available space as an indicator of the length of the expected response. Any variance must be reported and justified. The layout and numbering of the questions must be the same as in the master document.

> **Guideline 4.4.1C** The print quality must be the same as that of the master instruments. Respondents' opportunities to demonstrate their true abilities are impaired when print quality interferes with comprehension.

> **Guideline 4.4.1D** The screen display and resolution on the computer must follow the specifications developed by the PIAAC Consortium. Respondents' opportunities to demonstrate their true abilities are impaired when the screen display interferes with comprehension.

> **Guideline 4.4.1E** Translations must preserve the construct in accordance with the guidelines prepared by the PIAAC Consortium.

> **Guideline 4.4.1F** The purpose of cultural adaptation is to remove construct-irrelevant variance from the assessment items. It should not add such variance. Guidelines for general cultural appropriateness have been prepared by the PIAAC Consortium.

Standard 4.4.2 The translation and cultural adaptation of the direct assessment instruments must be carried out according to the guidelines prepared by the PIAAC Consortium, as well as translation and adaptation guidelines. Adaptation and translation of the direct assessment materials and the

background questionnaire (BQ) are crucial to the comparability and psychometric stability of the PIAAC data collection.

Guideline 4.4.2A Even with the most carefully written guidelines, the end product will be only as good as the translator(s) performing the work. Translators should be chosen with the greatest care. The ideal translator will have not only the skills required to properly translate the text from English to the target language, but also some notion of the particular challenges of assessment adaptation. The translator should likewise be familiar with the concepts surrounding the BQ.

Guideline 4.4.2B The first step in the adaptation and translation process is for the PIAAC Consortium to develop clearly written assessment adaptation guidelines. These guidelines should identify all of the factors in both the stimulus material and related questions that contribute to the difficulty of the item. For instance, the guidelines should identify the presence of keywords in the question and stimulus material and, if applicable, the presence of distracters. The translator should use these guidelines to convey not only the meaning of the stimulus material and the question, and not only the complexity of the language (technical vs. mundane), but also to maintain the psychometric properties of the items. The adapted and translated stimulus material should be as close as possible to the supplied English version, regardless of the language used. Wherever possible, punctuation should be duplicated. The size of graphics, font size, the typeface of written material and the general layout should be maintained.

Guideline 4.4.2C A set of guidelines similar to the ones developed for the direct assessment should be produced to describe the concepts being measured in the BQ. Because data collection methodology differs from country to country, it is important to ensure that the manner of collecting a particular variable maintains the integrity of the concept that should be captured by that variable.

Standard 4.4.3 Each country must submit its national versions of the PIAAC instruments to the PIAAC Consortium for verification and approval.

Quality Control Procedures

103.   The PIAAC Consortium will prepare master versions of all instruments in English.

104.   The PIAAC Consortium will prepare a set of guidelines for the translation and adaptation of the survey instruments (*i.e.* cognitive tasks as well as the BQ).

105.   The PIAAC Consortium will ensure that the design of the computer-based instruments follows the guidelines and that the questions and materials are distributed to respondents according to the assessment design. (See Standard 4.6.)

106.   The PIAAC Consortium will review all final national versions of the instruments to ensure that each country has followed the PIAAC-specified design standards.

107.   Each country must submit a copy of all of its materials to the PIAAC Consortium in each of the national languages being tested in PIAAC.

108.   Using the appropriate forms submitted to the PIAAC Consortium, countries must document the following:

- Variation from the recommended layout

- Any changes to assessment tasks

- Translation and cultural adaptation of the PIAAC instruments

4.5 NATIONAL OPTIONS FOR ASSESSMENTS

Purpose

109.   To limit the extent to which national centres deviate from or add components to the international design of PIAAC and to ensure that these do not interfere with the quality of the international data.

Rationale

110.   These standards serve to ensure that the quality of the data used for the international comparisons will not be affected by national options. Data for national options will be collected consistently across countries, and potential effects will be precluded.

Standards, Guidelines and Recommendations

Standard 4.5.1 The design of PIAAC has three types of components: 1) Core components (*i.e.* literacy assessment, numeracy assessment, and background questionnaire); 2) international options (*i.e.* reading components, problem solving in technology-rich environments, and the job requirements approach module); and 3) national options that are limited to supplemental samples. (See Section 3.5 for details.) The use of national options must be restricted and, when options have been approved by the PIACC Consortium, they must not affect the quality of the international data or response rates.

   Guideline 4.5.1A Each country may implement only supplemental samples that have been agreed upon between the national centre and the PIAAC Consortium.

   Guideline 4.5.1B These national options must not affect the international design of PIAAC.

   Guideline 4.5.1C Costs associated with national options (*i.e.* support, implementation and analysis) are the responsibility of the country implementing the options.

Quality Control Procedures

111.   The PIAAC Consortium will be responsible for approving and supervising national options.

112.   The PIAAC Consortium will provide detailed guidelines and will work with countries to ensure that national options do not affect the international portion of PIAAC.

4.6. PSYCHOMETRIC ASSESSMENT DESIGN

Purpose

113.   To ensure that the design of the PIAAC direct assessments will generate data that are psychometrically appropriate by consistent implementation across participating countries, using sound design principles and methods.

Rationale

114.   The PIAAC assessment design is complex because it measures four domains – literacy, numeracy, reading components and problem solving in technology-rich environments – across two modes of administration – paper-and-pencil and computer instruments. To ensure that the assessment results are comparable across participating countries, it is essential that the assessment be consistently administered in all countries. In summary, the PIAAC assessment design provides the following information:

115.   Component skills among lower-performing adults in each participating country, as well as among those who report not knowing how to use a computer;

116.   Population distributions in literacy, which can be linked to International Adult Literacy Survey (IALS)/Adult Literacy and Lifeskills Survey (ALL);

117.   Population distributions in numeracy, which can be linked to ALL;

Accurate estimates of population distributions and a baseline measure of problem solving in technology-rich environments, for estimation of trends over time;

118.   Strategies and processes that adults use when responding to the tasks on problem solving in technology rich-environments;

119.   Pair-wise covariance estimates among the various measures, including the relationships between literacy and numeracy, literacy and component skills, literacy and problem solving, numeracy and component skills, and numeracy and problem solving; and

120.   Information that can be used to analyze the relationship between the measured competencies and the PIAAC affective measures and social/economic measures (from the responses to the background questions and job requirements approach module).

Standards, Guidelines and Recommendations

Standard 4.6.1 The PIAAC psychometric assessment design for the field test must serve several purposes, including 1) to test the survey operations procedures; 2) to identify and correct items that are performing poorly, including the quality of translation and scoring procedures; and 3) to examine item characteristics for establishing comparability (*i.e.* to evaluate the equivalence of item parameters in two aspects: the linking of items from IALS/ALL to PIAAC and linking between the paper-and-pencil and computer formats).

   Guideline 4.6.1A The PIAAC field test design is based on the assumption that each item will be answered by a minimum of 150 adults, resulting in an estimated sample size of 1 500 respondents per country/per language (1 100 respondents for the computer-delivered test and 400 respondents for the paper-and-pencil test).

Guideline 4.6.1B The PIAAC field test design for the direct assessment is based on an assumption of an average of 60 minutes of testing time per respondent. However, PIAAC is not a timed assessment and some respondents may take longer. The PIAAC field test has the following characteristics:

121.   The paper-and-pencil branch of the assessment will include a ten-minute Core assessment of literacy and numeracy skills, with six tasks each. Respondents who pass the Core assessment will take two 20-minute clusters of either literacy or numeracy tasks, totalling 29 tasks, and a final ten-minute cluster of component skills. Four paper instruments will be designed.

122.   The computer-delivered branch of the assessment will include twenty-one 60-minute instruments, with two 30-minute blocks of items in each instrument. Overall, there will be thirteen 30-minute clusters that will be grouped to form the instrument (four clusters of literacy tasks, four clusters of numeracy tasks and five clusters of problem-solving tasks).

Guideline 4.6.1C The PIAAC psychometric assessment will be implemented using the design illustrated in Figure 4-1. A total of 1 500 respondents per country/per language will receive Core items on information and communication technology (ICT) skills. A small proportion of respondents without the minimum necessary ICT skills will be sent to the paper-and-pencil branch. A large majority of respondents with sufficient ICT skills will be proportionally randomly assigned to either the paper-and-pencil instrument (4/15) or the computer-delivered assessment (11/15).

Guideline 4.6.1D The field test paper-based instruments must be organised according to the design shown in Table 4-1, where P1 to P4 represent the four paper-based instruments, CL represents the Core literacy cluster, CN represents the Core numeracy cluster, L1 and L2 represent literacy clusters, and N1 and N2 represent numeracy clusters.

Figure 4-1. PIAAC Field Test Design for the Direct Assessment
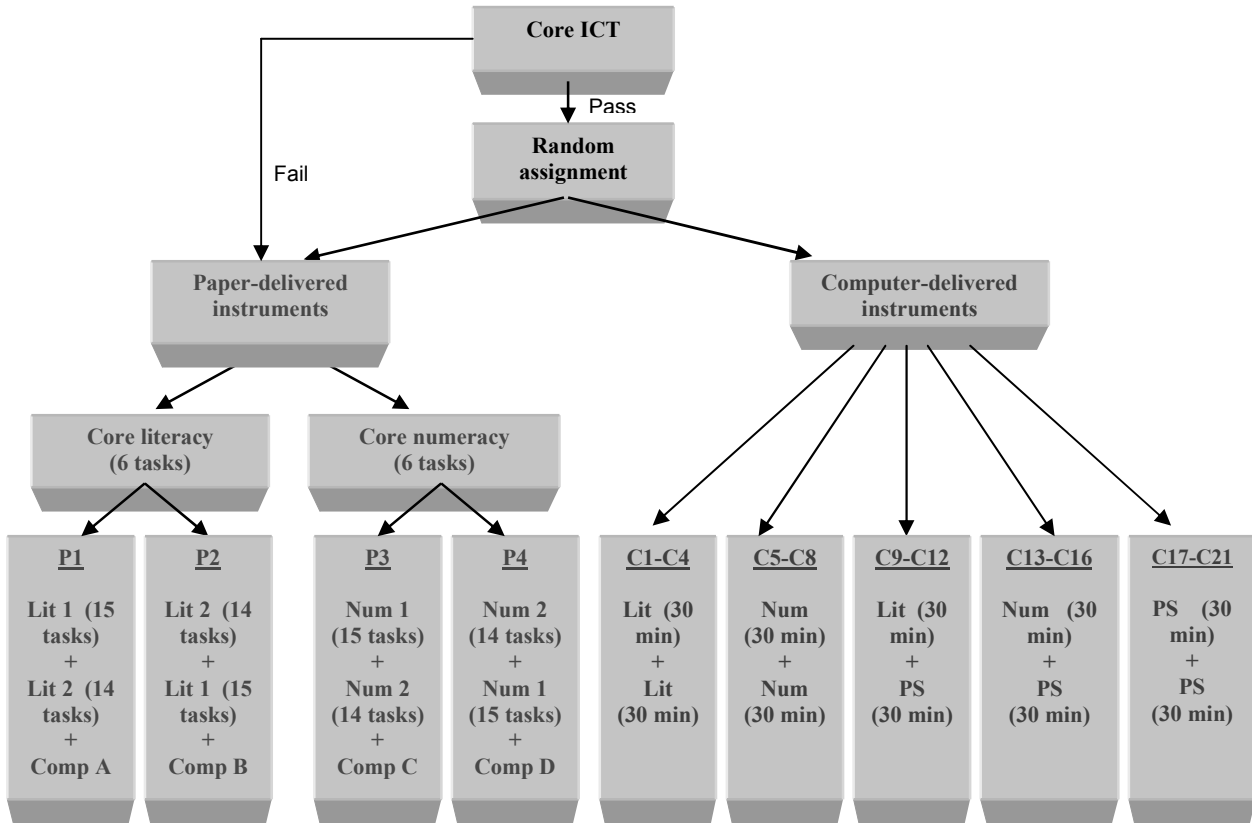
Table 4-1.   Design of the Field Test Paper-based Assessment Instruments in the Integrated Design

Paper-based Instrument	Clusters			
	Core (10 min)	1 (20 min)	2 (20 min)	3 (10 min)
P1	CL (6 lit tasks)	L1 (15 lit tasks)	L2 (14 lit tasks)	Components A
P2	CL (6 lit tasks)	L2 (14 lit tasks)	L1 (15 lit tasks)	Components B
P3	CN (6 num tasks)	N1 (15 num tasks)	N2 (14 num tasks)	Components C
P4	CN (6 mum tasks)	N2 (14 num tasks)	N1 (15 num tasks)	Components D

Guideline 4.6.1E The field test computer-based instruments are organised according to the design shown in Table 4-2, where C1 to C21 represent computer-based instruments, L1 to L4 represent literacy clusters, N1 to N4 represent numeracy clusters, and PS1 to PS5 represent problem-solving clusters.

**Table 4-2. Design of the Field Test Computer-based Assessment Instruments
in the Integrated Design**

Computer-based Instrument	Clusters	
	1 (30 min)	2 (30 min)
C1	L1	L2
C2	L2	L3
C3	L3	L4
C4	L4	L1
C5	N1	N2
C6	N2	N3
C7	N3	N4
C8	N4	N1
C9	L1	PS1
C10	L2	PS2
C11	L3	PS3
C12	L4	PS4
C13	N1	PS2
C14	N2	PS3
C15	N3	PS4
C16	N4	PS5
C17	PS1	PS2
C18	PS2	PS3
C19	PS3	PS4
C20	PS4	PS5
C21	PS5	PS1

Guideline 4.6.1F The PIAAC psychometric assessment may be modified for countries that do not intend to assess reading components, according to the following characteristics:

- The computer-delivered branch will be identical to the design shown in Figure 4-1, with all subscales.

- The paper-and-pencil branch will be shortened by ten minutes as it will not include the reading component skills block. The overall assessment time for the paper version of the direct assessment will be 50 minutes.

- The sample size will decrease to 1 400 respondents per language/per country (1 100 respondents for the computer-delivered test and 400 respondents for the paper-and-pencil test).

Guidelines 4.6.1G The PIAAC psychometric assessment may be modified for countries that do not intend to assess problem solving in technology-rich environments, according to the following characteristics:

- The paper-and-pencil branch of the assessment will be identical to the design shown in Figure 4-1, with all subscales.

- The computer-delivered branch will include eight instruments (four literacy-only and four numeracy-only instruments).

- The sample size will decrease to 1 200 respondents per language/per country (800 respondents for the computer-delivered test and 400 respondents for the paper-and-pencil test). This sample size will allow analysis to compensate for the lack of covariance information, so each item will be answered by 200 respondents.

Standard 4.6.2 The PIAAC psychometric assessment design for the main study must serve several purposes, including to 1) provide good measurement of the full range of measures included in PIAAC and 2) provide a baseline for assessing trends or changes over time in future rounds of PIAAC or similar assessments.

Guidelines 4.6.2A The PIAAC main study design is based on a minimum sample size of 5 000 adults per country/per language.

Guidelines 4.6.2B The PIAAC main study design for the direct assessment is based on an assumption of 60 minutes of testing time. However, PIAAC is not a timed assessment and some respondents may take longer to complete the assessment. The main study has the following characteristics:

- The paper-delivered branch of the assessment will include a ten-minute Core assessment of literacy and numeracy skills. Respondents who perform at or above a minimum standard will be randomly assigned to either a 30-minute cluster of literacy or a 30-minute cluster of numeracy items, followed by a 20-minute assessment of component skills. The small proportion of respondents who perform poorly on the Core tasks will skip the literacy and numeracy items and be routed to receive the component skills measures.

- The computer-delivered branch of the assessment will include a complex staging process that directs respondents to the literacy, numeracy or problem-solving sections of the assessment. Respondents following the computer branch are first directed to respond to the Core items. If they perform poorly on these Core tasks, they will be automatically directed to respond to the paper-and-pencil component measures. Respondents who perform at or above the minimum standard will be randomly assigned either to a two-stage adaptive measure of literacy or numeracy that requires approximately 25 minutes to complete or to a 25-minute cluster of problem-solving tasks. Following the first 25-minute cluster of either literacy or numeracy, half of the respondents will be directed to the alternative domain, ensuring that they respond to literacy and numeracy items presented in two different orders. The other respondents will be guided to a second set of problem-solving tasks based on their responses to the items in the literacy or numeracy clusters. A portion of respondents who attempt the problem-solving block first will be directed to either a numeracy or literacy block, while the other portion of respondents will be directed to a second set of problem-solving tasks.

Guideline 4.6.2C The PIAAC psychometric assessment will be implemented using the design illustrated in Figure 4-2, where L represents literacy tasks, N represents numeracy tasks and PSTRE represents tasks involving problem solving in technology-rich environments.

Figure 4-2. PIAAC Main Study Design for the Direct Assessment
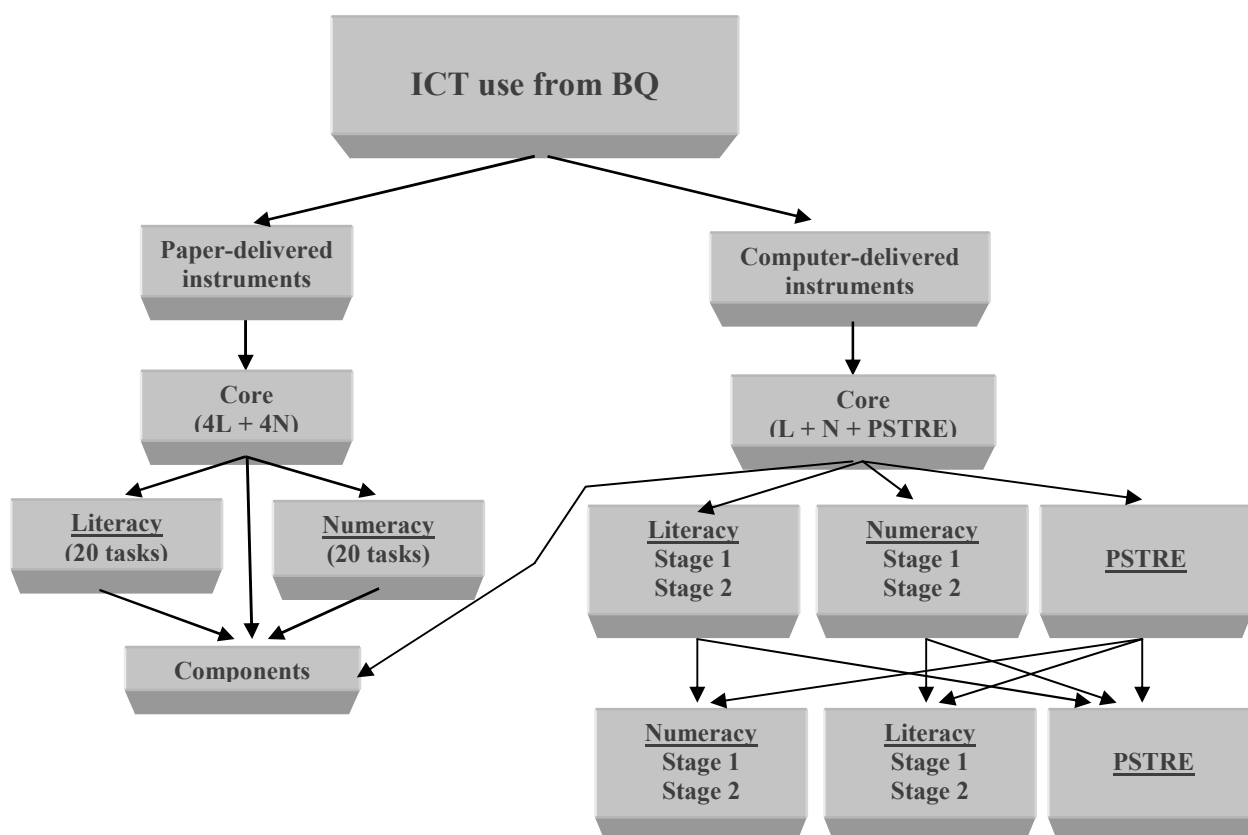
Guideline 4.6.2D The PIAAC psychometric assessment may be modified for countries that do not intend to assess reading components, according to the following characteristics:

- The computer-delivered branch will be identical to the design shown in Figure 4-2, with all subscales.

- The paper-delivered branch will be modified to overcome the loss of accuracy among respondents in the lowest ability range. Instead of the components block, this design increases the number of literacy and numeracy tasks presented to each respondent. One group of respondents will first respond to a set of literacy tasks followed by a set of numeracy tasks, while the other group will respond to a set of numeracy tasks followed by a set of literacy tasks.

- The sample size is unaffected by this option.

Guidelines 4.6.2E The PIAAC psychometric assessment may be modified for countries that do not intend to assess problem solving in technology-rich environments, according to the following characteristics:

- The paper-delivered branch of the assessment will be identical to the design shown in Figure 4-2, with all subscales.

- The computer-delivered branch will not include the tasks involving problem solving in technology-rich environments. Respondents who responded to the literacy tasks first will be directed to take the numeracy tasks next, while those who first responded to the numeracy tasks will receive the literacy tasks.

- The sample size will decrease to 4 000 respondents.

Quality Control Procedures

123.   The PIAAC Consortium will provide all participating countries with a document explaining the psychometric assessment design and administrative procedures.

124.   All participating countries are required to follow the international guidelines for implementing the assessment design.

4.7 INSTRUMENT REQUIREMENTS TO FACILITATE DATA PROCESSING

Purpose

125.   To ensure that allowance has been made on the survey instruments for recording critical information (*i.e.* Sample Identification Number) for linking all survey instruments and related materials for a respondent, as well as other administrative and analytical information.

Rationale

126.   Information for PIAAC will be collected in two modes: paper and computer. The data collected from each form should be co-ordinated and linked for later analyses. Both types of information play key roles for creating the international data file. While the computer automatically records information into a data file, paper-based instruments serve as a vehicle for recording respondent answers to questions as well as administrative information that is needed for case control purposes or that could be used for nonrespondent analyses.

Standards, Guidelines and Recommendations

Standard 4.7.1 A field for recording the respondent Sample Identification Number is required on all paper- and computer-based survey instruments (*i.e.* screening questionnaires, background questionnaires [BQs], Core and Main assessment instruments) and on any pertinent supplementary material.

   Guideline 4.7.1A The following information should be recorded on a paper or electronic form:

   • Final status code – BQ

   • Final status code – Core tasks

   • Final status code – Main tasks (paper)

   • Date of interview

   • Length of interview

        o   BQ start time and BQ end time
        o   Core tasks start and end time
        o   Main tasks start and end time

   • Language of completion for countries with more than one language

   • Interviewer Record of Contact

        o   visit number
        o   date
        o   time
        o   contact status code

- Number of visits

Guideline 4.7.1B The response categories for questions should be pre-coded (*i.e.* the numeric codes should be included next to each response category) to facilitate the capture of the questionnaire responses. These codes should be consistent with the codes specified on the International File Layout; otherwise, the captured data must be recoded to conform to the International File Layout.

Guideline 4.7.1C The Record of Contact is required as a source of information for nonresponse analysis. The interviewer should record the Record of Contact information each time a contact attempt is made to a selected household, including the attempt that results in a completed interview. The Contact Status Code will be coded using the list of final status codes.

Quality Control Procedures

127.   The PIAAC Consortium will ensure that the computer-assisted personal interviewing system that delivers the BQ addresses the requirements of data processing, identification of completed cases and nonresponse analyses.

128.   The PIAAC Consortium will provide detailed directions and information through training manuals and sessions for participating countries and their interviewers.

5. TRANSLATION AND ADAPTATION STANDARDS

5.1 NEWLY DEVELOPED COGNITIVE TEST ITEMS

Purpose

129.   To ensure that the same skill assessment information is collected across countries, across delivery modes (paper-and-pencil vs. computer-based), where applicable, and from one PIAAC cycle to the next.

Rationale

130.   If valid comparisons of assessment results are to be made across countries, across delivery modes and from one cycle to the next, the equivalence of different language versions of the assessment instruments is essential. For cognitive test instruments, "equivalence" refers to semantic equivalence (content), as well as equivalence in terms of register, style, readability and other characteristics likely to affect psychometric properties. Adaptations must conform to the PIAAC Adaptation Guidelines.

Standards, Guidelines and Recommendations

Standard 5.1.1 All PIAAC cognitive test instruments will be evaluated for linguistic correctness and for equivalence to the source version. Every effort will be made to produce psychometrically equivalent instruments in each national language being tested. Adaptations to the local context and/or for the mode of delivery (paper-and-pencil vs. computer-based) will be made as needed and must be documented and agreed upon.

Guideline 5.1.1 The participating countries are responsible for the translation of data collection instruments and their adaptation to national circumstances. The PIAAC Consortium provides support in the form of

- Source versions that have been reviewed for language and cultural issues.

- Translation and adaptation guidelines, both general and item specific. The item-specific guidelines will be listed in specially designed Verification Follow-up Forms that accompany each instrument throughout the translation/adaptation and verification process.

- A translation and adaptation training module.

Recommendation 5.1.1A The recommended procedure for developing the national versions is double translation by two independent translators, followed by reconciliation by a third translator.

Recommendation 5.1.1B It is also recommended that translations be reviewed by a national panel of domain and/or survey experts.

Quality Control Procedures

131.   All national versions of newly developed materials will go through full verification before the field test, in a two-step procedure:

   1. sentence-by-sentence check of linguistic correctness, equivalence to the source version and appropriateness of national adaptations. Suggested corrections will be listed and justified in the Verification Follow-up Form.

   2. final optical check to verify the final layout of the instruments after verification, the equivalence of computer and paper forms, and the correct implementation of verifiers' crucial suggestions from the first step.

132.   A system will be used for archiving and "locking" the national versions used in the field test, with a view to allowing main study revisions only in case of changes in the source version or to address identified residual translation or adaptation defects.

133.   All national versions of revised materials will go through partial verification before the main study. This procedure will focus on checking whether edits made between the field test and the main study comply with the PIAAC translation and adaptation guidelines and have been correctly implemented.

134.   A system will be used for archiving and "locking" the national versions used in the main study, with a view to their possible reuse in a future PIAAC cycle.

5.2 BACKGROUND QUESTIONNAIRE AND JOB REQUIREMENTS APPROACH MODULE

Purpose

135.   To ensure that comparable information on respondents' background is collected across countries and, where applicable, from one PIAAC cycle to the next or in relation to previous surveys.

Rationale

136.   If the assessment results are to be validly related to comparable background data across countries, the comparability of different language versions of the instruments is essential. For questionnaires, "comparability" refers to linguistic equivalence (content, register, style and readability), adjusted for controlled adaptations to local context.

Standards, Guidelines and Recommendations

Standard 5.2.1 Adaptations to the local context must first be documented and agreed upon, so that the PIAAC Consortium can prepare a customised source version reflecting those adaptations. In particular, wherever national classifications are used to capture information such as educational attainments or occupation categories, it must be possible to map these to the appropriate international classifications. All national versions of PIAAC questionnaires will then be evaluated for linguistic correctness and equivalence to the customised source version.

Guideline 5.2.1 The participating countries are responsible for the translation of data collection instruments and their adaptation to national circumstances. The PIAAC Consortium provides support in the form of:

- Production of customised English source versions that include agreed-upon national adaptations.

- Translation and adaptation guidelines, both general and item specific. The item-specific guidelines will be listed in the specially designed Background Questionnaire Adaptation Spreadsheet (BQAS) that will accompany each questionnaire throughout the adaptation agreement, translation and adaptation, and verification processes.

Recommendation 5.2.1A The recommended procedure for developing the national versions is double translation by two independent translators, followed by reconciliation by a third translator.

Recommendation 5.2.1B It is recommended that translations of questionnaires be reviewed by a national panel of survey experts.

Recommendation 5.2.1C Where questionnaire items from the International Adult Literacy Survey and the Adult Literacy and Lifeskills Survey are reused, it is recommended that countries reuse their previous translations.

Quality Control Procedures

137.   All national versions of questionnaires will go through an adaptation agreement process and a full verification before the field test, in a three-step procedure:

1. Negotiation and approval of adaptations, to ensure that, for example, national classifications can be mapped to the international classifications, using the BQAS as support. Once agreement is reached, the customised source version reflecting approved adaptations will be produced.
2. Sentence-by-sentence check of linguistic correctness, equivalence of the national version to the customised source version, and correct implementation of approved national adaptations. Suggested corrections will be listed and justified in the BQAS.
3. Final optical check to verify the final layout of the instrument after verification and the correct implementation of verifiers' crucial suggestions from the second step.

138.   A system will be used for archiving and "locking" the national versions used in the field test, with a view to allowing main study revisions only in case of changes in the source version or to address identified residual translation or adaptation defects.

139.   All national versions of revised materials will go through partial verification before the main study. This procedure will focus on checking whether the edits made between the field test and the main study comply with the PIAAC translation and adaptation guidelines and have been correctly implemented.

140.   A system will be used for archiving and "locking" the national versions used in the main study, with a view to their possible reuse in a future PIAAC cycle.

5.3 COGNITIVE TEST ITEMS USED FOR LINKING

Purpose

141.   To ensure that PIAAC collects the same skill assessment information as the International Adult Literacy Survey (IALS) and the Adult Literacy and Lifeskills Survey (ALL), for the purpose of analyzing trends.

Rationale

142.   If valid comparisons are to be made between the assessment results of PIAAC and the previous surveys, it is essential to use the same instruments ("if you want to measure change, don't change the measure").

Standards, Guidelines and Recommendations

Standard 5.3.1 Test items used for linking will be administered unchanged from their previous administration. Any changes needed because of format, delivery mode or other reasons must be documented and agreed upon.

> **Guideline 5.3.1A** Participating countries that participated in IALS and ALL are responsible for the preparation of their linking items. The PIAAC Consortium will provide support in the form of instructions.

> **Guideline 5.3.1B** For participating countries that did not participate in IALS and ALL, the linking test items will have the same status as newly developed test items. (See Section 4.1.)

Quality Control Procedures

143.   For countries that participated in IALS and ALL, all national versions of linking items will be evaluated for equivalence to the PIAAC source version before the field test, in a two-step procedure:

1. Sentence-by-sentence check of linguistic correctness, equivalence to the PIAAC source version, and appropriateness of national adaptations and any changes needed because of format, delivery mode, or other reasons. Suggested corrections will be listed and justified in the Verification Follow-up Form. Verifiers will receive special instructions not to make any cosmetic changes or suggestions for improvement if the country is using a previously administered version and if that country has documented changes or adaptations to that version.
2. Final optical check to verify the final layout of the instruments after verification, evaluate the equivalence of computer and paper forms, and verify the correct implementation of verifiers' crucial suggestions from the first step.

144.   A system will be used for archiving and "locking" the national versions used in the field test, with a view to allowing main study revisions only to address identified residual translation or adaptation defects (which may sometimes be needed even though such changes interfere with the ability to analyze trends).

145.   All national versions of revised materials will go through partial verification before the main study. This procedure will focus on checking whether the edits made between the field test and the main study are justified and have been correctly implemented.

146.	A system will be used for archiving and "locking" the national versions used in the main study, with a view to their possible reuse in a future PIAAC cycle.

6. INFORMATION TECHNOLOGY STANDARDS

6.1 QUALIFICATIONS OF NATIONAL INFORMATION TECHNOLOGY CO-ORDINATOR

Purpose

147.   To ensure that all personnel responsible for information technology (IT) operations on PIAAC have an adequate knowledge of how to provide first-level support in their country.

Rationale

148.   Because the National IT Co-ordinator will be responsible for operational IT issues (*e.g.* purchasing and selecting the laptop computers used for PIAAC, training interviewers, repairing interviewers' laptop computers), it is expected that these personnel will have adequate qualifications and experience.

Standards, Guidelines and Recommendations

Standard 6.1.1 Each National IT Co-ordinator must fulfil the following qualification profile:

- Experience in troubleshooting hardware and networking problems;

- Experience in troubleshooting web-based or web services problems;

- Experience with the operating system specified for use by that country (*e.g.* Windows, Linux);

- Experience in extracting survey data from laptop computers and managing the formatting and cleaning of data for delivery;

- Experience using trouble ticket systems and/or providing first- and second-level support;

- Experience using virtual machine technologies at the workstation level (*e.g.* VMware Workstation 6.0 or VMware Player 2.0);

- Familiarity with survey operations.

Recommendation 6.1.1 The following qualifications will also be beneficial for IT support operations:

- Experience training interviewers to operate laptop computers and the survey software (this function could also be performed by the National Project Manager);

- IT certifications for the software and operating system used in that country (*e.g.* Microsoft MCSA/MCSE/MCITP, Linux LPIC, VMware VCP);

- IT certifications that are support centred (*e.g.* ITIL Foundation).

Quality Control Procedures

149.   Before the field test, countries will be required to document the qualifications of their IT support staff.

6.2 HARDWARE (LAPTOP COMPUTER) SPECIFICATIONS AND MINIMUM CAPABILITIES

Purpose

150.   To ensure that the laptop computers used in the survey meet certain minimum requirements, thereby preventing problems with instrument delivery.

Rationale

151.   Because the TAO platform used in the survey will be based on a virtual machine, the laptop computers must meet certain hardware requirements for functionality. In particular, the standards for CPU and memory configurations must be met to limit the possibility of software failure.

Standards, Guidelines and Recommendations

Standard 6.2.1 At a minimum, laptop computers used in PIAAC should have the following hardware configuration:

- An x86-32-based 1,5 gigahertz (GHz) Intel or AMD processor (*e.g.* Intel Pentium 4, AMD Athlon XP);

- At least 1 gigabyte (GB) of random access memory (RAM) (for 32-bit operating systems) or 2 GB of RAM (for 64-bit or Windows Vista operating systems);

- A 14" thin film transistor (TFT) colour screen;

- A 1 024 x 768 (XGA) resolution;

- 10 GB of free space on the hard drive;

- Two batteries with at least two hours of run time;

- A device for storing or uploading data files, as defined in the country's specifications (*e.g.* a network connection, a USB stick or CD/DVD-burning equipment).

Guideline 6.2.1A The above-mentioned processor speed and memory size are necessary to provide a stable environment for the TAO platform. For systems equipped with less than these minimum requirements, the functionality of the software cannot be guaranteed.

Guideline 6.2.1B The PIAAC Consortium has specified a minimum screen size of 14", with a 1 024 x 768 (XGA) resolution. If a 14" TFT screen is used, the resolution should not be too high (*e.g.* 1 600 x 1 200), because the font size may be too small for elderly participants to read. If a resolution higher than 1 024 x 768 is used, the screen size will have to be adapted accordingly (15" or 17").

Guideline 6.2.1C The laptop computers must include either a CD/DVD drive, a USB port or a network connection for software installation, uploading of data and backup.

Guideline 6.2.1D All specifications mentioned above are minimum requirements to run the TAO platform. For optimal results, the configuration described in Recommendation 6.2.1B will be preferred.

Recommendation 6.2.1A The following hardware configuration will also be beneficial for information technology operations:

- A modem, network or wireless interface (depending on the specific country management interface required);

- A network connection for uploading data files to web services or as an alternative for installing software if no CD/DVD drive can be provided;

- A CD/DVD drive for software installation; and

- Alternatively, a USB interface for software installation, data file storage and backup.

Recommendation 6.2.1B The following laptop computer configuration is recommended by the PIAAC Consortium for optimal performance:

- An x86-64-based multi-core Intel or AMD processor (*e.g.* Intel Core 2 Duo, Intel Core 2 Quad, AMD Turion, AMD Phenom);

- 2 GB of RAM;

- A maximum of 3 GB of RAM, as many laptop computer chipsets are not able to handle more memory (especially 32-bit operating systems);

- A 15" or larger colour TFT screen with no glare;

- A USB interface, if data are to be backed up on USB sticks;

- A CD/RW or DVD/RW drive, if data are to backed up on CD-Rs or DVD-Rs;

- Two batteries with four or five hours of run time (or additional battery packs with less run time).

Recommendation 6.2.1C The PIAAC Consortium recommends that each country use a single configuration, to reduce risks, limit the level of configuration and technical support required, and increase the overall reliability and stability of the platform during the field period. If this approach is adopted, countries ought to use PIAAC laptop computers only for the PIAAC field test and main study and not for other surveys.

Quality Control Procedures

152. Before the beginning of the field test, countries will be required to document their laptop computer configuration.

6.3 OPERATING SYSTEM STANDARDS

Purpose

153.   To ensure that the operating system on PIAAC laptop computers is compatible with the survey software.

Rationale

154.   Because the TAO platform used in the survey is based on a virtual machine using VMware products, only operating systems that are compatible with this software can be used for PIAAC.

Standards, Guidelines and Recommendations

Standard 6.3.1 The operating system must be compatible with VMware software (*e.g.* VMware Server for Windows).

Standard 6.3.2 The PIAAC Consortium will support the operating systems Windows 2000 Professional, Windows XP Professional (32-bit version), and Windows Vista Business, Enterprise, or Ultimate (32-bit or 64-bit version).

> **Guideline 6.3.2** The Macintosh OS 10.x and Linux (kernel > 2.6.x) operating systems can be supported upon special request.

> **Recommendation 6.3.2** It is recommended that the Microsoft operating systems be used for the survey, because products such as VMware Player or VMware Server are free software on this platform.

Quality Control Procedures

155.   Before the field test, countries will be required to document the operating system to be used on their laptop computers. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

6.4 SOFTWARE AND HARDWARE CONFIGURATION STANDARDS

Purpose

156.   To ensure that minimum software and hardware configuration standards are met by each country.

Rationale

157.   Because of differences in information technology configurations between countries, the PIAAC Consortium cannot require a specific configuration. However, the software and hardware configuration standards described below can be considered an absolute minimum for operation.

Standards, Guidelines and Recommendations

Standard 6.4.1 On each laptop computer, participating countries must install a VMware workstation-level product such as VMware Server, VMware Player 2.0, VMware Workstation 6.0 or VMware Fusion (Macintosh OS only). Because the TAO platform operates within a virtual machine with its own drivers and software interfaces, there will be no limitations on the software used on the host system.

Standard 6.4.2 The user starting the virtual machine must have rights to save data into the specified data folder.

Standard 6.4.3 The delivery and data folder must be implemented with a directory structure that can be processed by VMware products.

Quality Control Procedures

158.   Before the field test, countries will be required to document their software and hardware configurations as well as their country-specific laptop computer configuration. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

159.   Countries will be required to follow pre-defined test scenarios provided by the PIAAC Consortium. Documentation of successful tests must be provided to the PIAAC Consortium.

6.5 SOFTWARE INTERFACE STANDARDS FOR INTEGRATION WITH COUNTRY-SPECIFIC MANAGEMENT SYSTEMS

Purpose

160.   To describe minimum standards for integration of PIAAC survey systems with country-specific management systems.

Rationale

161.   Local information technology processes within a country, and thus the documentation of these processes, cannot be specified by the PIAAC Consortium. These standards for the integration of PIAAC survey systems with country-specific management systems can be considered an absolute minimum for operation.

Standards, Guidelines and Recommendations

Standard 6.5.1 The TAO platform will deliver data files in the standard industry format XML. The PIAAC Consortium will additionally offer a data extraction tool for preprocessing and parsing the XML data files.

> **Recommendation 6.5.1** The PIAAC Consortium will also offer software interface standards with embedded encryption for security reasons.

Quality Control Procedures

162.   Before the field test, countries will be required to document the interaction of the PIAAC survey systems with their country-specific management system. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

163.   Countries are required to perform tests specified by the PIAAC Consortium. These include tests for installing and interacting with preliminary versions of the virtual machine to be used for instrument delivery. Test results must be provided to the PIAAC Consortium.

6.6 SOFTWARE CONFIGURATION MANAGEMENT STANDARDS

Purpose

164.   To recommend software configuration management standards that will ensure stability in the interaction between the TAO platform and the software already installed on survey laptop computers.

Rationale

165.   Because software installation and update management will be country specific and will not be performed by the PIAAC Consortium, the consortium can specify only the software configuration for the internal components of the TAO platform's virtual machine. The PIAAC Consortium cannot specify standards for managing the configuration and versioning of third-party software also installed on the interviewers' laptop computers. Therefore, this section is limited to providing recommendations for countries that have not yet implemented such a system.

Standards, Guidelines and Recommendations

Recommendation 6.6.1 Even though standards cannot be specified, the PIAAC Consortium recommends industry-standard procedures such as ITIL or COBIT for this purpose.

Guideline 6.6.1A Within the TAO platform, configuration management is performed according to the following workflow:

- Management and planning (the process is started by ongoing software development or update demands)

- Configuration and identification

- Configuration control

- Configuration status accounting

- Configuration verification and audit

Guideline 6.6.1B All versioning or tests will be performed within the virtual platform, so no physical testing lab is necessary. After changes have been audited and documented, updated virtual machines will be delivered to the National Information Technology Co-ordinators, who can simply exchange the former virtual machine with the new version by simply copying the virtual hard drive. In addition to exchanging the entire virtual machine, a script-based patching mechanism will be implemented for minor changes.

Quality Control Procedures

166.   Before the field test, countries will be required to document the software configuration management procedures for their laptop computer configuration. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

167.	Countries are required to perform tests of the VM delivery system and of the patching system. These will be provided by the PIAAC Consortium. The test status has to be provided to the PIAAC Consortium.

6.7 CENTRAL TECHNICAL SUPPORT STANDARDS

Purpose

168.   To define the standards for central technical support to be provided by the PIAAC Consortium through the international helpdesk.

Rationale

169.   The PIAAC Consortium will provide support for participating countries beginning at the design stage of the project and continuing through survey operations and final data delivery. Throughout the project, the National Information Technology (IT) Co-ordinator will act as the primary point of communication regarding the IT aspects of the project. The National IT Co-ordinator should be knowledgeable about IT and familiar with survey operations in his/her country.

Standards, Guidelines and Recommendations

Standard 6.7.1 The PIAAC Consortium will establish a helpdesk where trained staff will triage problems as they are reported by the National IT Co-ordinators, direct the problem to the appropriate contractor or staff for resolution, and track the problems to ensure that they are resolved. The National IT Co-ordinator will therefore collect all IT-related problems within his/her country and forward to the PIAAC helpdesk problems that s/he cannot resolve.

Standard 6.7.2 Because of variations in the time zones where PIAAC is to be in operation, e-mail and web-based reporting of IT problems is likely to work best because these methods can be used at any time. Problems can also be reported by telephone between 9 am and 5 pm, Monday through Friday, Middle European Standard Time, during the data collection period (field test and main study). The National IT Co-ordinators will be provided with contact information for the international helpdesk.

> **Recommendation 6.7.2** Although telephone support will be available through the PIAAC Consortium only between 9 am and 5 pm Middle European Standard Time, individual countries are encouraged to implement a 24/7 IT support hotline to provide first-level support.

Standard 6.7.3 The PIAAC Consortium's goal will be to resolve problems as quickly as possible using a knowledgebase of previously reported problems and their solutions. Problems will be prioritized based on how critical they are to data collection. After a first automated response, the PIAAC Consortium will acknowledge receipt of a problem report within one business day (Middle European Time) and provide an estimated date and time of resolution.

Standard 6.7.4 The PIAAC Consortium will maintain statistics on the number and type of problems reported, as well as the length of time required to resolve reported problems. Resolution procedures may be changed according to criticality levels and measured response times for appropriate solutions.

Standard 6.7.5 All of the above-mentioned standards are to be implemented and documented on the PIAAC Consortium's local Open Ticket Response System (OTRS) server, which will be available through Internet connectivity on a 24/7 basis (meaning availability 24 hours a day, seven days a week, with an industry-standard failure percentage). OTRS is an open source product and is now considered to be one of the industry standards in ticketing systems.

Quality Control Procedures

170.   Before the field test, countries will be required to document their technical support procedures. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

171.   The PIAAC Consortium will collect all problem reports in the OTRS database and prepare regular reports on the stability and reliability of the platform.

6.8 COUNTRY-SPECIFIC TECHNICAL SUPPORT STANDARDS

Purpose

172.   To define expectations for country-specific technical support provided by each country's national helpdesk.

Rationale

173.   The countries or their information technology (IT) contractors will be primarily responsible for resolving PIAAC-related operational issues in their countries, including hardware issues (replacing or repairing interviewer laptop computers, providing backup laptop computers), survey operations (assigning cases to interviewers, resolving interviewer questions, resetting cases to a prior state, removing or saving data from a laptop computer), resolving most questions about the content of the study, and tracking and reporting problems with the computer platform or applications.

Standards, Guidelines and Recommendations

Standard 6.8.1 The National IT Co-ordinator will be responsible for the following tasks and procedures:

- Obtaining sufficient laptop computers to support survey operations, including spare laptop computers for backup purposes in case of hardware failures;

- Configuring these laptop computers with survey software to PIAAC Consortium specifications;

- Testing the TAO system on country laptop computers, as specified by the PIAAC Consortium;

- Training interviewers in the operation of the laptop computers and the survey software;

- Operating a national helpdesk to provide technical support for interviewers during the field period;

- Extracting survey data from laptop computers and managing the formatting and cleaning of the data for delivery to the PIAAC Consortium.

Recommendation 6.8.1 The PIAAC Consortium recommends that each country have a designated PIAAC helpdesk, with contact information provided to each of its interviewers and supervisors. The country helpdesk staff must be familiar with the PIAAC computer platform, applications, and training materials. Additionally, they must be familiar with all national software, standards and procedures. Staff members working on the helpdesk should attend the interviewer training sessions so they learn to use the applications and appreciate the challenges faced by the interviewing staff.

Quality Control Procedures

174.   Before the field test, countries will be required to document their technical support procedures. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

175.   Countries must document and report on the successful implementation of all steps listed above.

6.9 INFORMATION TECHNOLOGY DOCUMENTATION STANDARDS

Purpose

176.   To ensure that information technology (IT) processes and standards are appropriately documented.

Rationale

177.   Country-specific IT processes, and thus the documentation of these processes, cannot be specified by the PIAAC Consortium. Nevertheless, the PIAAC Consortium recommends that countries adopt documentation standards such as those specified in ISO/IEC 6592 or ANSI 10.3. The PIAAC Consortium can specify IT documentation standards for only two processes: documentation of IT support cases and documentation of software development. Therefore, this section contains only the standards the PIAAC Consortium will use internally. Participating countries are invited to follow this example.

Standards, Guidelines and Recommendations

Standard 6.9.1 All IT procedures must be documented.

Guideline 6.9.1A Documentation of IT support processes will be automated through the Open Ticket Response System (OTRS). (See Section 6.7.) OTRS can be used to document all support cases, to sort them according to specified parameters and to generate reports or automated help pages. The PIAAC Consortium and the National IT Co-ordinators will be able to view these reports and generate help files within the system.

Guideline 6.9.1B Documentation of internal software development will be performed using the MANTIS bug-tracking system. MANTIS is a documentation system similar to OTRS, but with a stronger focus on versioning and software coding. All changes in code, remarks or versions can be followed by all participating PIAAC Consortium software developers. Furthermore, the system will provide automatic reporting and change management.

Guideline 6.9.1C Additional documentation for National IT Co-ordinators will be provided in HTB user manuals, which will be continuously revised during the project to reflect enhancements, and through web-based or video-based training materials.

Guideline 6.9.1D The PIAAC Consortium will also provide documents and procedures for using the authoring tools to develop the background questionnaire and the job requirements approach module and to handle the delivery system. These documents will include easy step-by-step (scripted) instructions. These instructions will reflect all human-computer interactions with the authoring tools and the delivery system and will include screen shots of all major interactions with these entities, as well as information about what to do in case problems emerge. These documents will be available as separate files for download and will also be included in the help system of the authoring tools and the delivery system. They will be continuously revised to reflect system enhancements and address comprehension problems. These documents will be delivered only for the specified baseline system. Countries that choose to change the baseline system will be responsible for changing the contents of the help system accordingly.

Guideline 6.9.1E All instructional materials will be documented, including a manual for data collectors and a training guide for trainers. Both will be developed in English. The training guide will include a fully scripted training program, to ensure standardisation across training sessions and

countries. A variety of approaches to training will be included (*e.g.* lectures, exercises and hands-on practice).

Quality Control Procedures

178.   Before the field test, countries will be required to document their documentation standards. This documentation must be sent to the PIAAC Consortium for review before the end of June 2009, because system integration tests for the countries will start at the end of September 2009.

7. FIELD MANAGEMENT STANDARDS

7.1 ORGANISATION OF DATA COLLECTION STAFF

Purpose

179.   To ensure a high-calibre and well-organised data collection staff, which is of critical importance to data quality.

Rationale

180.   Close supervision and mentoring of the data collection staff are required to produce the best quality data. The supervisor-to-staff ratio should be low enough to ensure that interviewer work is of acceptable quality, to uncover potential issues that may have an impact on the survey data, and to allow for opportunities to provide and receive feedback at all levels of the field management structure.

181.   Each position within the field management structure should have defined roles to ensure that the staff performs efficiently and effectively.

Standards, Guidelines and Recommendations

Standard 7.1.1 The successful implementation of data collection requires a variety of staff – including interviewers, supervisors, field managers and a field director – with clearly defined roles and responsibilities.

Guideline 7.1.1A Several factors determine the number of interviewers required for data collection (see Standard 7.3.1). The interviewer's duties should include the following:

- Completion of interviewer training (see Section 8.4)

- Location of sampled persons

- Administration of survey instruments following the PIAAC procedures, as presented at training;

- Submission of survey data in a timely manner

- Reporting to a supervisor on a regular basis

- Performance of various administrative procedures

Guideline 7.1.1B There should be at least 1 supervisor for every 15 to 17 interviewers, constituting one region. The supervisor's duties should include the following:

- Interviewer staffing for the region

- Completion of supervisor training (see Section 8.3)

- Participation in interviewer training (see Section 8.4);

- Day-to-day management of the field effort for the defined region, including case assignment and reassignment among interviewers;

- Ongoing monitoring of each interviewer's work, including goal setting for each interviewer;

- Involvement in the implementation of quality control procedures;

- Weekly conference calls with each interviewer;

- Nonresponse follow-up;

- Validation of each interviewer's work (see Section 9.9);

- Reporting to a field manager on a weekly basis.

Guideline 7.1.1C There should be at least one field manager for every three to five interviewer supervisors. The field manager's duties should include the following:

- Participation in supervisor and interviewer training (see Sections 8.3 and 8.4)

- Oversight of interviewer hiring

- Ongoing monitoring of each region's work

- Supervision of the supervisors

- Weekly conference calls with each supervisor in his/her assignment

- Development and implementation of techniques for motivating interviewers, reassigning cases, converting nonresponse and related functions

- Reporting to the field director on a weekly basis

Guideline 7.1.1D There should be one field director overseeing the entire effort. The field director's duties should include the following:

development of a field plan, including determination of the number of interviewers to be hired (see Standard 7.3.1);

- Hiring of field managers and supervisors

- Preparation of materials for interviewer training (see Section 8.5)

- Preparation of materials for and conduct of supervisor training (see Section 8.3)

- Ongoing monitoring of the entire data collection effort, including interviewer production and costs, with particular attention to quality control procedures

- Supervision of the field managers

- Weekly conference calls with the field managers

- Development of various reports for project management, including production reports, as well as responses to ad hoc requests;

- Development and implementation of strategies in response to issues that arise during data collection, such as high levels of nonresponse or the need for attrition training.

Recommendation 7.1.1A On a strong project team, members at the upper levels of the management structure will have worked together effectively on similar projects.

Recommendation 7.1.1B The field director should be based at the survey institute's home office, while the field managers and supervisors may operate from the field.

Standard 7.1.2 Staff must remain in close, regular communication throughout the data collection period.

Guideline 7.1.2A Field supervisors should have weekly conference calls with each interviewer to discuss progress and problems, productivity and response rates, and a strategy for the completion of remaining cases in the assignment.

Guideline 7.1.2B Field managers should have weekly conference calls with each supervisor in their assignment to discuss progress toward production and cost goals, review travel plans, assess interviewer resources within the region, and identify potential problems.

Guideline 7.1.2C The field director should have weekly conference calls with the field managers to discuss data collection efforts and issues that have occurred in the field and to review production and cost reports.

Guideline 7.1.2D In addition to scheduled weekly conference calls between data collection staff, the interviewers, supervisors, field managers and field director should be available on a daily basis by e-mail or telephone to provide status updates, answer questions or provide other information.

Recommendation 7.1.2 Countries should develop a monthly newsletter as a way of sharing information among the field staff and fostering concepts of teamwork and common goals. The newsletter should report regional and overall production. It can also be used as a forum for improving aspects of the fieldwork, for instance, sharing ideas for working difficult cases, new approaches to increase productivity or techniques for convincing reluctant respondents to participate.

Quality Control Procedures

182.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed management structure and their plan for facilitating communication at all levels.

183.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of recruitment and hiring of field staff and field management for the field test and the main study.

7.2 SUPERVISION AND MONITORING OF DATA COLLECTION STAFF

Purpose

184.   To ensure that data collection is being conducted according to PIAAC standards and that data collection staff are administering the instruments in a manner that is consistent with the defined PIAAC procedures.

Rationale

185.   To ensure the collection of high-quality data, continual monitoring at all levels of the data collection process is required. Automated reports, used in conjunction with other measures, are integral to the successful monitoring of data collection.

Standards, Guidelines and Recommendations

Standard 7.2.1 Data collection must be very closely monitored at all stages.

> **Guideline 7.2.1A** Weekly conference calls should be held between all staff working on the project. As discussed in Section 7.1, the field director should have regular discussions with each field manager, the field managers should have regular discussions with each supervisor, and the supervisors should have regular discussions with each interviewer.

> **Guideline 7.2.1B** Interviewers' work should be monitored throughout the data collection period using various methods and techniques, including review of tape-recorded interviews, validation, automated editing systems, review of completed materials, and automated reports. (See Section 9.9 for a full discussion of quality control measures.) Ongoing monitoring of each interviewer's work should assess factors such as the quality of the completed interviews, the number of completed interviews, the response rate, the average interview duration and interviewer costs.

> **Guideline 7.2.1C** Automated reports are a key component of the review of interviewers' work and are instrumental to the weekly report calls. (See Section 7.1.) Interviewers must transmit interview data on a daily basis to guarantee that the automated reports reflect the current status of data collection.

> **Recommendation 7.2.1** The supervisor or field manager should perform in-person observation of interviewers' performance, particularly staff new to interviewing. (See Section 9.9.)

Quality Control Procedures

186.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their adherence to the standards and guidelines developed for data collection supervision and monitoring of the data collection staff.

187.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of data collection supervision and monitoring and the techniques being used.

7.3 PREPARING FOR THE HIRING AND MANAGEMENT OF DATA COLLECTION STAFF

Purpose

188.	To ensure that adequate time is devoted to all components of the hiring process, including locating, interviewing and hiring high-quality candidates for PIAAC.

Rationale

189.	The quality of the data collection staff significantly affects the quality of the data collected. Therefore, ample time must be devoted to thoughtful planning of the field staff resources required for PIAAC. Consideration must be given to a variety of issues, including the size of the field staff and their desired characteristics.

190.	It is also important to ensure that the interviewers are assigned a manageable workload and that the remuneration method is not a deterrent to data quality. Levels of interviewer pay and the pay structure can both affect interviewers' motivation to work hard to enhance their response rates. If an interviewer is paid for the number of hours actually worked (*e.g.* hourly wage or weekly salary), s/he is more likely to devote time to refusal avoidance, refusal conversion and other aspects of data collection. Payment on a piecework basis also increases the risk that the quality of an interviewer's work may suffer.

Standards, Guidelines and Recommendations

Standard 7.3.1 Diverse factors must be considered when determining the number of field staff required for a successful PIAAC effort.

    Guideline 7.3.1A The number of field staff required by each survey institute will depend on several factors that are unique to each country, including the geographic area to be sampled, travel time to assignments, the type of sampling frame, historical field labour use and typical hours per completed case for similar national surveys, and typical response rates. Other factors that influence the decision, such as the interview length and the length of the field period, will be consistent across countries.

    Guideline 7.3.1B Based on the survey institute's staff retention experience, countries should plan to over-hire by a large enough percentage to account for attrition during all stages of the data collection effort, including training and production.

    Guideline 7.3.1C Countries should hire a minimum of two interviewers per staffing area, as this ensures adequate coverage for an area and avoids the need to have interviewers travel in case of attrition, interviewer illness or vacation, or other factors.

    Guideline 7.3.1D The final determination of the target number of field staff to be recruited and hired should be made at least 14 weeks before the start of data collection.

Standard 7.3.2 Adequate time must be allotted for data collection staff recruiting and hiring.

    Guideline 7.3.2A To ensure the availability of sufficient staff to conduct interviewer recruiting and hiring, field managers and regional supervisory staff must be assigned to PIAAC at least 12 weeks before the start of data collection.

Guideline 7.3.2B Interviewer recruiting and hiring should commence at least 11 weeks before the start of data collection to ensure sufficient lead time to conduct all steps of the process, including identifying, interviewing and hiring candidates.

Standard 7.3.3 Countries will be responsible for hiring the required number of interviewing staff with the desired characteristics.

Recommendation 7.3.3A Countries should attempt to hire interviewers with at least two to three years of experience in conducting household surveys, as there is evidence that more experienced interviewers tend to achieve higher response rates than those with less experience. Similarly, countries should attempt to hire supervisors with interviewing experience and field managers with supervisory experience.

Recommendation 7.3.3B Other desirable interviewer characteristics include experience with literacy-related surveys, experience with surveys involving computer-assisted interviewing, and computer or typing experience.

Recommendation 7.3.3C To improve cost efficiency, interviewers should live within close proximity of the assignment location. Additionally, hiring interviewers indigenous to the area appears to increase response rates, as local interviewers are more available to visit reluctant respondents and have a greater chance of building rapport by identifying with local interests.

Recommendation 7.3.3D In determining which language skills are appropriate for interviewers, countries should consider the languages in which the interview will be administered, as well as the languages spoken by large numbers of special populations.

Recommendation 7.3.3E Countries should consider the racial and ethnic diversity of the population, as hiring interviewers of various backgrounds may help to establish respondent rapport.

Standard 7.3.4 Countries will employ a sufficient number of interviewers so that the maximum assignment size for an interviewer is 40 completed assessments per month.

Guideline 7.3.4A Interviewers must be able to devote, on average, at least 25 hours per week to the project and must be available during a variety of hours – weekdays, weekends, daytime and evenings. The average duration of the PIAAC interview is approximately 90 to 105 minutes, excluding the time needed to identify the respondent, explain the survey and convince the respondent to participate. It is expected that an interviewer will be able to conduct, on average, no more than two interviews per day for 20 days per month.

Guideline 7.3.4B Countries should specify a maximum assignment size per interviewer, as response rates can be affected by the amount of work allocated to each interviewer. The interviewer must be given an assignment that is large enough to make it financially worthwhile but not so large that it is difficult to complete in a timely manner. The assignment size will affect the amount of effort an interviewer can apply to attempting contact and securing co-operation from each sampled individual.

Guideline 7.3.4C Beyond assignment size, countries should ensure that interviewers are not overloaded with work from other surveys or jobs with other companies. Such competing obligations may lead interviewers to give one job priority over another, in terms of completing work on time or putting in the effort to maximise response rates.

Guideline 7.3.4D In determining assignment size, it is also important to consider the number of interviews that will be required to reach the monthly targets for completed work. For example, the monthly targets for the field test may be 700 completed interviews in Month 1, 500 completed interviews in Month 2, and 300 completed interviews in Month 3. Countries should plan for the fact that cases at the beginning of the field period are typically easier to work, while those at the end require additional locating and refusal conversion efforts.

Standard 7.3.5 The basis for remunerating interviewers for their work must be independent of the number of completed interviews. In other words, interviewers are not to be remunerated on a piecework basis.

Guideline 7.3.5A The pay rates for the study must be set in relation to the length and complexity of the interview, the expected difficulties of obtaining co-operation and the amount of record keeping demanded of the interviewer.

Guideline 7.3.5B The pay rate must be attractive in relation to pay on other studies. Interviewers should be paid for the number of hours worked, rather than being remunerated based on the number of completed interviews achieved. However, it may be acceptable to remunerate the interviewer on some other basis provided that steps are taken to ensure that the interviewer's work meets a consistently high level of quality.

Recommendation 7.3.5 Interviewers can be offered incentives, on a piecework basis, for completing assigned or additional cases or for completing cases on a timelier basis. If an incentive programme is implemented, countries must closely monitor both the effectiveness of the strategy in motivating the interviewers and the quality of the data collected as part of the bonus programme. The incentive plan should be in place at the start of data collection and referred to during the hiring process so that it has a positive influence on hiring, retention and production.

Quality Control Procedures

191.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their interviewer employment conditions (*e.g.* pay type and assignment size) and interviewer characteristics (*e.g.* number of years of survey experience).

192.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of interviewer retention and attrition, as well as any changes to the remuneration strategy.

7.4 RECRUITING AND HIRING DATA COLLECTION STAFF

Purpose

193.   To recruit high-quality data collectors, in accordance with each country's hiring laws and practices.

Rationale

194.   Data quality depends on the competence of the data collection staff. Therefore, an extensive search must be conducted to identify the best-qualified candidates for PIAAC. Various characteristics have been determined to be integral in selecting candidates. Careful attention should be given to the hiring process, as the survey institute must also conform to national laws, requirements and guidelines related to hiring.

Standards, Guidelines and Recommendations

Standard 7.4.1 Potential interviewers for PIAAC should be drawn from a variety of sources.

   Guideline 7.4.1 Potential candidates should be drawn from the following sources, at a minimum:

   - Files of people who previously worked for the survey institute

   - Job posting on the survey institute's website

   - Recommendations from experienced supervisory staff employed by the survey institute

   - Local organisations such as senior centres and libraries

   - Classified advertisements

Standard 7.4.2 Various applicant qualifications must be considered during the applicant selection process to ensure a qualified and competent data collection staff.

   Guideline 7.4.2A The following interviewer qualifications should be considered:

   - Availability during the field period and training

   - Proximity to the assignment

   - Skills (*e.g.* communication, computer, language)

   - Experience (*e.g.* interviewing, teaching)

   - Community outreach work or sales experience

   - Education

   - Access to transportation

Guideline 7.4.2B A telephone screening interview should be conducted with potential candidates. This interview should accomplish several purposes: 1) to inform the candidate about the potential job; 2) to eliminate people who are unable to meet the minimum requirements; and 3) to inform the recruiter about the applicant's demeanour, personality, coherence of speaking, general experience and other characteristics.

Guideline 7.4.2C For candidates who pass the screening call, an in-depth recruitment interview should be conducted by the regional supervisor or field manager.

Guideline 7.4.2D The following elements should be considered when preparing for and conducting the in-depth interview: 1) the interview should be conducted in a professional setting, 2) 30 to 40 minutes should be allotted for each interview, and 3) interviews should be conducted in accordance with the country's laws and the survey institute's policies.

Guideline 7.4.2E The following topics should be discussed during the in-depth interviews: 1) introduction to the project, 2) review of the candidate's application or resume, 3) review of the PIAAC job description, 4) review of the applicant's availability, 5) review of access to transportation, 6) level of computer experience and familiarity, and 7) need for the applicant to pass a language certification test, if required or applicable.

Guideline 7.4.2F After the in-depth interview, countries must conduct employment verification and reference checks of applicants.

Recommendation 7.4.2A The in-depth interview should be conducted in person if possible, to allow the supervisor to assess the applicant's professional/neutral appearance. The interview can be conducted by telephone if budget or time constraints preclude an in-person interview.

Recommendation 7.4.2B Countries should consider requiring applicants to conduct a practice interview (10-15 questions) as part of the in-depth interview process.

Recommendation 7.4.2C To retain recruits before and through training, countries should maintain regular contact with those who have accepted the survey institute's offer.

Quality Control Procedures

195.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their plans for interviewer recruiting and hiring.

196.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of recruitment and hiring for the field test and the main study.

8. DATA COLLECTION STAFF TRAINING STANDARDS

8.1 TRAINING APPROACH

Purpose

197.   To ensure that all data collection staff are thoroughly trained in PIAAC instruments and procedures.

Rationale

198.   In-person training is designed to maximise trainees' involvement and participation in the training and to provide ample opportunity for supervisory staff to observe and evaluate trainee performance. A single in-person training session enables the country to use its best training staff and allows the field period to start at the same time for all data collectors.

199.   All interviewer training sessions must be fully scripted to ensure consistency of presentation across training rooms, which is particularly important when a large number of interviewers are being trained in separate sessions across countries. Scripted materials also ensure that all training points are adequately covered, eliminating the need for training staff to speak extemporaneously, and allowing all trainers to study the training guides in advance and rehearse their roles. To maintain trainee interest and attention, the training sessions use a mixture of presentation techniques, such as demonstrations, interactive lectures and interviews, and exercises.

Standards, Guidelines and Recommendations

Standard 8.1.1 The comprehensive interviewer training package developed by the PIAAC Consortium must be used by participating countries to train their PIAAC data collectors.

Guideline 8.1.1A The data collector training must be conducted in person, with some elements distributed as home study materials before the in-person session. Distributing a home study packet to trainees prior to in-person training is cost-efficient and will maximise productivity at training.

Guideline 8.1.1B A detailed training agenda must be developed to ensure that training covers all aspects of the data collector's job and addresses all components of the study. The training agenda must list the topic and length of each training session, as it will be used during training to keep the training staff on schedule.

Guideline 8.1.1C The training must be fully scripted and use a variety of tools, including lectures, interactive discussions, role plays and exercises. The exercises simulate situations interviewers can expect to encounter in the field and provide a means for interviewer evaluation.

Guideline 8.1.1D The trainer guide must include all materials to be used in training, including lecture scripts, role-playing exercises, handouts, transparencies and written exercises with answer keys.

Guideline 8.1.1E An interviewer manual must be developed to provide detailed information on the background of the study, the study design and purpose, and thorough documentation of all project procedures. Interviewers will use this as a reference after training when situations arise in the field.

Quality Control Procedures

200.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed approach to training and their preliminary plan for conducting the session.

201.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of scheduling and conducting training for the field test and the main study.

8.2 ORGANISATION AND LOGISTICS OF TRAINING

Purpose

202.   To provide adequate training staff, space and equipment to ensure a successful data collector training.

Rationale

203.   To ensure that the training sessions run smoothly and that trainees are effectively instructed in all aspects of the study, countries must secure appropriate meeting space, equipment, and experienced staff and make all logistical arrangements.

204.   Trainers must be 1) very familiar with the study and the materials and 2) effective teachers with ability to motivate and control trainees and keep the training on schedule in accordance with the PIAAC agenda. Adequate space, equipment and logistical planning are especially important on a computer-assisted interviewing study.

Standards, Guidelines and Recommendations

Standard 8.2.1 Countries must locate and reserve adequate space in which to conduct the trainings.

Guideline 8.2.1A The training location must have sufficient meeting space to accommodate the required number of separate training rooms, as well as additional space for an office and storage of training materials and equipment.

Guideline 8.2.1B The training location must have an adequate electrical supply in each room to support the laptop computers and other equipment. Countries must arrange for data display machines, overhead projectors and any other technical equipment needed for the training session.

Recommendation 8.2.1A All interviewers should be trained simultaneously, with approximately 15 to 20 interviewers per training room. The number of trainees and supervisory regions will determine the number of training rooms required.

Recommendation 8.2.1B A hotel with adequate meeting space should be used for the training session. Trainees can stay overnight on site, which eliminates transportation issues, and meals can be served easily during training.

Recommendation 8.2.1C Tables should be arranged in the training room in a U-shaped pattern, to allow all trainees a good view of both the trainer and each other and to permit technical staff to easily assist individuals if necessary.

Recommendation 8.2.1D During interactive instrument lectures, a data display machine and laptop computer should be set up so that trainees can follow along with the trainer.

Standard 8.2.2 Countries must assemble a competent, experienced staff to conduct the training sessions.

Guideline 8.2.2A The interviewer training staff must be capable of discussing all aspects of the interview work, including study overview, face-to-face interviewing, administration of the

questionnaire and assessments, contact strategies, refusal avoidance and conversion, quality control, and administrative tasks.

Guideline 8.2.2B Each training room must have a lead trainer who has training or teaching experience and who possesses the expertise required to provide training on the activities listed above.

Guideline 8.2.2C An assistant trainer must be present in each room to assist the lead trainer and the trainees. The assistant trainer must also observe and evaluate the trainees during the sessions.

Guideline 8.2.2D An individual designated as "technical support" must be assigned to every one to two training rooms for the duration of the training to resolve any systems-related issues. The availability of technical support staff allows for the timely resolution of systems issues and thereby prevents delays in the training.

Recommendation 8.2.2A In each training room, a designated individual should operate the laptop computer that is projected on the screen for all interviewers to view.

Recommendation 8.2.2B During training, trainees should be grouped by supervisory region. The trainees' regional field supervisor should serve as the assistant trainer, so that s/he has an opportunity to evaluate the interviewers s/he will supervise during data collection.

Recommendation 8.2.2C Training staff, preferably regional field supervisors, should score the required written exercises completed by trainees during training.

Recommendation 8.2.2D The field director or a field manager should be the lead trainer for training in general interviewing techniques. Field supervisors should also be present for this session to evaluate the trainees. (See Section 8.4.)

Quality Control Procedures

205.	As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed plan for scheduling and conducting training, including location, background of the lead trainers (including expertise in training and any substantive areas applicable to PIAAC) and other aspects of the training plan.

206.	During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of scheduling training and arranging training staff for the field test and the main study.

8.3 SUPERVISOR TRAINING AND TRAIN-THE-TRAINERS

Purpose

207.   To provide training for the staff responsible for the training and supervision of interviewers, so they can adequately train, evaluate and supervise the interviewing staff.

Rationale

208.   Conducting a train-the-trainers session ensures standardisation of training script delivery in the interviewer training sessions and gives the training staff an opportunity to learn the PIAAC procedures and materials before interviewer training. The train-the-trainers session also serves as a dry run of the training materials, so that countries can revise the materials as needed before interviewer training.

209.   Supervisor training provides the field supervisors with the skills to monitor and motivate the interviewers in their region. It is crucial that supervisors are familiar with all aspects of the study procedures and materials, as they will serve as the primary source for ongoing training during data collection and will conduct quality control measures.

Standards, Guidelines and Recommendations

Standard 8.3.1 Countries must conduct a train-the-trainers session in which training staff are introduced to the lecture scripts and materials they will use to conduct interviewer training.

Guideline 8.3.1A All lead trainers, assistant trainers and technical support staff must attend the relevant portions of the train-the-trainers session before interviewer training.

Guideline 8.3.1B The train-the-trainers session must be scheduled approximately three to four weeks prior to the start of data collection, allowing sufficient time for revisions to training materials before the interviewer training sessions.

Guideline 8.3.1C The train-the-trainers session must cover all scripts and exercises that will be used in the interviewer training so that it can serve as a dress rehearsal for the interviewer training.

Guideline 8.3.1D The train-the-trainers session will be approximately three days in length.

Guideline 8.3.1E The train-the-trainers session must immediately precede the supervisor training session.

Standard 8.3.2 Prior to interviewer training, each country must conduct a supervisor training, to be attended by all regional supervisors and field managers.

Guideline 8.3.2A Supervisor training must cover supervisory responsibilities during data collection, including report monitoring, oversight of interviewers and quality control.

Guideline 8.3.2B Supervisor training must be conducted by an experienced member of the PIAAC project staff, preferably the field director.

Guideline 8.3.2C Supervisors must receive a detailed supervisor manual. (See Section 8.5.)

Recommendation 8.3.2 Supervisor training should be approximately one to two days in length.

Quality Control Procedures

210.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed plans for the train-the-trainer and supervisor training sessions.

211.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of scheduling and conducting the train-the-trainer session and supervisor training, as well as the outcome of the sessions.

8.4 INTERVIEWER TRAINING

Purpose

212.   To provide adequate training in all aspects of PIAAC administration, as well as general interviewing techniques and administrative procedures, so that interviewers are able to collect high-quality data and obtain required response rates.

Rationale

213.   If they are to accurately follow the study procedures, collect high-quality data and achieve high response rates, interviewers must be knowledgeable about both general interviewing techniques (GIT) and the details of PIAAC. Providing training on GIT and computer-assisted interviewing (CAI) helps to ensure that new interviewers acquire the basic skills necessary to work as an interviewer and to participate in project-specific training.

214.   The project-specific training will ensure that the interviewing staff are well trained on PIAAC concepts, instruments and procedures. Training on the details of PIAAC and on refusal aversion and conversion should increase response rates. Training scripts and exercises are designed to address situations the interviewers are likely to encounter in the field.

Standards, Guidelines and Recommendations

Standard 8.4.1 Each country is responsible for training its team of data collectors.

Standard 8.4.2 All PIAAC interviewers must receive a minimum of 32 hours of in-person project-specific training over four days.

> **Guideline 8.4.2A** The project training must take place no earlier than two weeks before, and preferably during the week immediately prior to, the scheduled commencement of data collection. This will allow interviewers to immediately apply the skills developed in training and will minimise the likelihood of interviewers forgetting material learned at training.

> **Guideline 8.4.2B** The following aspects shall be covered during project-specific training:

- Introduction to PIAAC (minimum of 30 minutes)

- Demonstration of the survey (minimum of 60 minutes)

- Review of advance materials (minimum of 30 minutes)

- Contact strategy for contacting intended respondents (minimum of one hour)

- Gaining the co-operation of contacted respondents, avoiding refusals and converting refusals (minimum of three hours)

- Locating households and respondents (approximately 90 minutes)

- Study management system operation, including data transmission procedures (minimum of three hours)

- Administrative tasks, including rules on assignment of disposition codes, use of the household/case folder and completion of the record of calls (minimum of two hours)

- Screener administration, if a screener is used (minimum of two hours)

- Administration of the background questionnaire and job requirements approach module (minimum of six and one-half hours)

- Administration of automated and pencil-and-paper assessment instruments (minimum of four hours)

- Quality control and monitoring of interviewer work (minimum of 30 minutes)

- Practice interviews, in the form of role plays and/or live respondent practice (minimum of eight hours)

- Question-and-answer session following the role plays and/or live respondent practice (minimum of 30 minutes).

Recommendation 8.4.2A Training staff should hold nightly debriefing sessions to discuss the progress of training, trainee evaluations, and any procedural or technical issues or questions that have arisen.

Recommendation 8.4.2B A question box should be available in each training room for trainees to submit written questions. This practice reduces interruptions to training caused by excessive trainee questions. Also, it will allow interviewers who are reluctant to speak to ask questions. The questions should be discussed at the evening debriefing session, and memoranda addressing the questions should be distributed to training staff the next morning for discussion with trainees.

Recommendation 8.4.2C During training, countries should provide supplemental evening review sessions for interviewers who want additional practice or are identified as needing additional practice with the various study components.

Recommendation 8.4.2D All interviewers should have the opportunity to conduct at least one complete unscripted practice interview with a respondent unfamiliar with the PIAAC study, after which the interviewer should receive feedback from training staff.

Standard 8.4.3 In countries that conduct the survey in multiple languages, interviewers must be trained in each language in which they will personally conduct interviews.

Recommendation 8.4.3A If a country chooses to conduct the survey in multiple languages, and thus will conduct interviewer trainings in multiple languages, it may choose to combine the trainings for cost-efficiency purposes. If the interviewers are bilingual, administrative portions of training could be conducted in only one language, as long as interviewers are given instruction and practice on the materials and instruments in the language(s) in which they will conduct interviews.

Recommendation 8.4.3B Countries that will collect data in only one official language, but will translate the background questionnaire/job requirements approach module into a secondary language(s), should conduct the full project training in the primary language in which data will be collected. Bilingual interviewers should attend a minimum of five hours of additional training in the

secondary language. Secondary language training, which must be conducted in each additional language in which the country will collect data, should include the following components:

- Gaining the co-operation of contacted respondents (including a review of advance materials), avoiding refusals and converting refusals (minimum of 60 minutes)

- Practice interviews and assessments, in the form of role plays and/or paid respondent practice (minimum of four hours)

Recommendation 8.4.3C Bilingual interviewer training should include an interactive lecture on the background questionnaire, the job requirements approach module, and automated and pencil-and-paper assessment administration (approximately two hours), in addition to the training elements noted in Recommendation 8.4.3B.

Standard 8.4.4 Interviewers must complete approximately two to four hours of home study training prior to in-person training.

Guideline 8.4.4A Home study packets will be distributed to interviewers approximately two to three weeks prior to in-person training.

Guideline 8.4.4B The home study training must include, at a minimum, an introduction to and an overview of PIAAC, with a written exercise to be collected and verified at in-person training. Written exercises ensure that the interviewers complete the required components of the home study packet.

Recommendation 8.4.4A Countries may choose to include additional materials or exercises to be completed as part of the home study packet:

- Two-hour home study would include the introduction and written exercise, as well as selected procedures, administrative tasks or materials from GIT training. (See Standard 8.4.5.)
- Four-hour home study would include more of each of the materials listed above, as well as a self-guided CAI tutorial. (See Standard 8.4.6.)

Recommendation 8.4.4B Interviewer laptop computers should be included with the home study materials. Accordingly, instructions on the use and care of the laptop computer should be included, as well as a practice component, such as learning how to send e-mail.

Standard 8.4.5 Interviewers who are new to social science interviewing must receive approximately four hours of GIT training prior to project-specific training.

Guideline 8.4.5 GIT training must include the following components:

- An introduction to survey research, providing examples of types of survey questions and interviewing terminology

- The conventions for asking survey questions and recording answers

- Written and oral exercises on asking questions, recording responses and applying probing techniques to obtain accurate data

- Gaining respondent co-operation, in which the following concepts are discussed:

- o interviewer behaviour and style when making contact with the respondent;
- o the importance of making effective and fast connections with the respondent;
- o methods to overcome resistance and address respondent concerns;
- o written and oral exercises on refusal aversion techniques and how to answer respondent questions.

- Standards and ethics in survey research, including information on informed consent, data confidentiality, and data security and a written exercise that includes consent and confidentiality scenarios that interviewers may confront during data collection

- Remuneration and administrative aspects of working for the survey institute

- Laptop computer basics

Recommendation 8.4.5A To minimise travel costs and optimise learning, GIT training should be held immediately before project-specific training.

Recommendation 8.4.5B GIT training should be conducted in person, but some components may be administered as part of the home study training, if this better suits the country's needs.

Standard 8.4.6 Interviewers who are new to CAI must complete training on CAI procedures and techniques before project-specific training.

Guideline 8.4.6A The CAI training must instruct interviewers on CAI questionnaire format, question types, function keys and special commands specific to the study.

Guideline 8.4.6B CAI training may be either self-guided or trainer led. It may be developed as either a pencil-and-paper exercise using screen shot images from the actual PIAAC interviews or as an automated exercise that mimics the actual system to be used during data collection.

Recommendation 8.4.6A CAI training should be designed as a self-guided, automated tutorial, including practice in logging on to the computer and navigating the PIAAC instruments and management system.

Recommendation 8.4.6B To be certified on CAI techniques, interviewers should be required to successfully complete a written exercise as part of the CAI training.

Quality Control Procedures

215.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed training plans and materials, including any planned deviations from the materials developed by the PIAAC Consortium.

216.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on data collector training for the field test and the main study. The results of training must be documented and reported to the PIAAC Consortium, including the number of interviewers who completed training as well as the number of interviewers who were released during or after training and the reasons for their termination.

8.5 DEVELOPMENT OF TRAINING MATERIALS

Purpose

217.   To ensure the availability of well-developed training materials, which are essential to the successful conduct of training.

Rationale

218.   The training materials developed by the PIAAC Consortium will provide interviewers with thorough instruction on the administration of the PIAAC interview. The use of materials developed by the PIAAC Consortium will ensure that staff in all participating countries receive standardised training.

Standards, Guidelines and Recommendations

Standard 8.5.1 Countries will use the training materials developed by the PIAAC Consortium in conducting their interviewer trainings.

   Guideline 8.5.1A Training materials include the training agenda, the training guide, the interviewer manual and written exercises.

   Guideline 8.5.1B Each country is responsible for the translation of all training materials from English into the country's administration language(s). (See Section 5.)

Standard 8.5.2 In addition to materials provided by the PIAAC Consortium, each country must develop training materials on any country-specific issues, such as additional background questionnaire items, the study management system, administrative procedures, the screening questions, and procedures for locating households and respondents.

   Guideline 8.5.2 Each country must use the PIAAC Consortium's training approach and must use the training guides and manuals developed by the PIAAC Consortium as a model when developing country-specific training materials. For example, the training must be fully scripted, must address all common scenarios, and must be fully reviewed and tested in advance of training.

Standard 8.5.3 A supervisor manual must be produced for all field supervisors.

   Guideline 8.5.3 The supervisor manual must contain the following components:

   - techniques for supervising staff;
   - instructions for using the study management system to oversee production, run reports, assign and transfer cases, and perform other functions;
   - quality control responsibilities;
   - administrative procedures.

Quality Control Procedures

219.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed training plan and country-specific training.

220.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of training for the field test and the main study. A copy of the training plans and materials must be submitted to the PIAAC Consortium. Any deviations from the procedures developed by the PIAAC Consortium must be documented and reported.

8.6 EVALUATION OF TRAINEES

Purpose

221.   To assess interviewers' abilities before they begin data collection and to provide feedback as needed.

Rationale

222.   Training provides an opportunity to assess interviewers before they begin data collection. Interviewer performance – generally throughout training and specifically on scored written exercises and in role plays – demonstrates ability and allows training staff to identify weaknesses and work with the interviewers to improve their skills.

Standards, Guidelines and Recommendations

Standard 8.6.1 Countries must evaluate interviewers' performance during training.

Guideline 8.6.1A Evaluation of trainees will be based on criteria developed according to the requirements of the interview instruments, materials and procedures.

Guideline 8.6.1B To evaluate trainees, training staff will use the evaluation form designed by the PIAAC Consortium.

Guideline 8.6.1C Training staff must identify trainees with potential performance problems and discuss remedial measures.

Recommendation 8.6.1A Countries should certify interviewers based on the following components:

- a completed role-play or paid respondent interview, observed by a member of the training staff;
- completed exercises from general interviewing techniques training, computer-assisted interviewing training, and project-specific training;
- language certification, as appropriate.

Recommendation 8.6.1B Trainees exhibiting performance problems should be paired during the role-play interviews with a more experienced trainee or with the assistant trainer.

Recommendation 8.6.1C Each country should hold nightly review sessions on an as-needed basis for trainees in need of additional help. Trainees may volunteer to attend the nightly session or be required by supervisors to attend. (See Section 8.4.)

Recommendation 8.6.1D If a trainee does not successfully complete training, the country may choose to either provide the trainee with post-training remedial work or dismiss the trainee.

Standard 8.6.2 At supervisor and interviewer training, the project team must evaluate supervisors on their ability to perform their defined responsibilities.

Quality Control Procedures

223.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed plan for evaluating trainee performance.

224.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the interviewer evaluation methods used at training and the results of that evaluation.

8.7 ONGOING INTERVIEWER TRAINING

Purpose

225.   To ensure that interviewers are kept informed of new issues that arise during the field period, that their skills are maintained and that they are adequately trained in areas that need improvement.

Rationale

226.   Through field monitoring and other forms of quality control, countries may identify issues during data collection that require additional training for some or all interviewers. Appropriate documentation of these issues and their resolution will ensure that all PIAAC interviewers receive adequate training and adhere to standard procedures.

Standards, Guidelines and Recommendations

Standard 8.7.1 Each country must, in a timely fashion, address issues that arise during data collection by providing appropriate retraining or training on new issues.

> **Guideline 8.7.1A** Interviewers must receive feedback, both individually and as a group, as follows:

- Provide immediate individual feedback if there has been a critical error.
- Provide routine individual feedback for self-improvement.
- Offer group feedback to focus efforts on improving the data collection process.

> **Guideline 8.7.1B** Each country must document any ongoing training that occurs once data collection has begun.

> **Recommendation 8.7.1A** To ensure cost efficiency, countries should provide ongoing training in the form of training memoranda or packets that are distributed to the appropriate interviewers and discussed between interviewers and supervisors, rather than conducting additional in-person training sessions. Interviewers should be given written exercises to complete. Role-play exercises can be conducted by interviewers over the telephone.

> **Recommendation 8.7.1B** Supervisors should conduct conference calls with all interviewers in their regions to discuss issues that arise.

Quality Control Procedures

227.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed training plan, including plans for retraining as appropriate.

228.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, training issues and resolutions for the field test and the main study.

8.8 INTERVIEWER ATTRITION TRAINING

Purpose

229.   To ensure a sufficient data collection staff, in spite of staff attrition.

Rationale

230.   Conducting attrition training sessions will ensure that a sufficient number of trained interviewers are available for data collection and that data collection is completed in a timely manner.

Standards, Guidelines and Recommendations

Standard 8.8.1 Countries must conduct attrition training if a significant number of interviewers do not complete the principal in-person training session or if substantial staff attrition occurs during data collection.

> **Guideline 8.8.1** Based on its experience with other national surveys, each country should, during the planning process, assess the need for attrition training. In most cases, countries should plan on one attrition training session.

Standard 8.8.2 All standards and guidelines associated with interviewer training apply to attrition trainings. (See Sections 8.2, 8.4, 8.5 and 8.6.)

> **Guideline 8.8.2** Materials identical to those used for the main project training must be used for the attrition training.

Quality Control Procedures

231.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their proposed plans for dealing with interviewer attrition and providing attrition training.

232.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, the number of interviewers who have left the study, as well as the status of attrition trainings for the field test and the main study.

9. DATA COLLECTION STANDARDS

9.1 ASSIGNMENT PREPARATION

Purpose

233.   To ensure that adequate numbers of the materials required during data collection are prepared and distributed to interviewers before the start of the data collection effort.

Rationale

234.   Data collection should start immediately following interviewer training, to ensure that interviewers do not forget the study procedures and to build off the interest and excitement generated during the training. All study materials required for the PIAAC interview, as well as materials needed for administrative tasks, must be available to interviewers before they work their first assignment.

Standards, Guidelines and Recommendations

Standard 9.1.1 Countries must develop and produce all interviewer materials that are required for the successful completion of the data collection effort.

Guideline 9.1.1A Interviewers should be provided with all materials required to work their first assignment of cases. Assignment-specific materials include materials that are directly associated with a particular case, such as case folders and a log of all cases in the assignment.

Guideline 9.1.1B Interviewers should be provided with an adequate supply of bulk materials to be used throughout data collection. Bulk materials are not tied to a particular case or assignment and include items such as paper assessment instruments, handcard booklets, administrative forms, pencils and pens, and envelopes for returning case-specific materials to the survey institute.

Guideline 9.1.1C When assigning work to interviewers and preparing materials for interviewer assignments, countries should consider a phased approach to data collection:

- Phase 1 is the initial set of assignments during which local interviewers work their assigned cases, making the required number of visits to try to complete necessary interviews. During this phase, an interviewer may receive several sets of cases or assignments

- Phase 2 is local reassignment, during which supervisors review the details of each difficult case to determine if it is appropriate to reassign it to another nearby interviewer

Recommendation 9.1.1 If resources allow, countries should consider travelling reassignment, where supervisors review region-level response rates and nonresponse cases to determine the productivity and cost effectiveness of sending an elite travelling interviewer or other experienced interviewer on a nonresponse conversion trip.

Quality Control Procedures

235.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their plans for study preparation and distribution of materials.

236.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the preparation and distribution of various study materials.

9.2 ADVANCE CONTACT STRATEGY

Purpose

237.   To ease initial respondent contact, convince potential respondents of the legitimacy of the survey, motivate respondent co-operation and increase response rates.

Rationale

238.   Respondents are usually more co-operative when they receive advance information about the survey's purpose, sponsor, use of data and other details. Through a professional, attractive advance mailing, potential respondents receive a brief introduction to the study before the interviewer's initial contact, which helps to legitimise the study, stress the importance of the effort and ease the interviewer's contact. Additionally, these advance materials serve to increase the study's response rates.

Standards, Guidelines and Recommendations

Standard 9.2.1 Introductory material, explaining the purpose of the PIAAC survey, will be provided to each selected respondent or household before the interview.

Guideline 9.2.1A When an address is available for respondents or households, a letter printed on official stationery must be mailed in advance of the interviewer's initial contact. The letter should be printed in all appropriate languages as defined by the survey institute.

Guideline 9.2.1B An attractive brochure should be developed and either mailed in conjunction with the advance letter or given to the respondent during the initial contact. This brochure should further serve to legitimise the study, stress the study's importance and motivate respondent co-operation. The following information should be included in the brochure:

- Why the study matters and why the respondent should participate

- Topics included in the survey

- How the respondent's address or name was obtained

- Why another person or household cannot be substituted for the respondent

- Confidentiality of the data

- Users of the data

- Length of the interview

- Toll-free telephone number

- URL of the respondent website

Guideline 9.2.1C The advance mailings must be staggered to correspond with the planned schedule of visits to the area.

Guideline 9.2.1D A respondent website must be designed and available before the first advance mailing. This website should contain information about the study, including the sponsoring agency, the data collection contractor, background on PIAAC and what the study entails if the potential respondent is selected for participation.

Guideline 9.2.1E Any advance materials must include a PIAAC-specific toll-free telephone number and website address where potential respondents can access additional information about the survey.

Guideline 9.2.1F Interviewers must receive an adequate supply of advance materials to present when making initial and subsequent contacts with households. Providing the interviewers with advance materials helps to ensure that the materials reach all selected respondents.

Recommendation 9.2.1A The advance mailing should be timed to arrive approximately two to five days before the interviewer's visit.

Recommendation 9.2.1B A project logo should appear on all study materials that are presented to potential respondents. The unifying logo serves to motivate co-operation by increasing respondent recall of materials and tying introductory and other survey materials together.

Recommendation 9.2.1C If an incentive is being used, it should be mentioned in the advance letter.

Recommendation 9.2.1D Countries should consider the use of endorsement letters from well-respected organisations with cogent statements that will help to convince respondents to participate. Endorsement letters can be presented upon initial contact or during refusal conversion efforts.

Recommendation 9.2.1E Additional forms of survey promotion should be considered, including information activities directed toward the public. Activities may include newspaper articles or television and radio advertising, with references to the website established for the study.

Recommendation 9.2.1F It may be useful to notify the police station in the area in which data are being collected. It is reassuring for elderly or suspicious respondents to be told that the police know about the survey and that they can check with the police station. Countries should develop a letter for the police department that can either be mailed by interviewers once assignments are received or handed out to members of the police department as needed (along with information on the study, including the website address and toll-free telephone number).

Quality Control Procedures

239. As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their planned strategy for promoting PIAAC.

240. During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on PIAAC promotion efforts, including all materials that will be developed and how the materials will be disseminated.

9.3 CONTACT PROCEDURES

Purpose

241.   To improve the chances of contacting selected households and individuals, thereby maximising the survey response rate.

Rationale

242.   A well-formulated contact strategy is important to ensure that interviewers make every effort to reach selected individuals. Such a strategy is essential to maximise response rates and thus obtain high-quality data.

Standards, Guidelines and Recommendations

Standard 9.3.1 Introductory materials explaining the purpose of PIAAC must be provided to the respondent before conducting the interview. (See Section 9.2.)

Standard 9.3.2 Initial contact with sampled households or individuals should be in person, because telephone contacts are more likely to lead to refusals. However, initial contact by telephone is permissible if this is part of a country's typical survey procedure for household surveys.

Standard 9.3.3 For countries that initially contact respondents during an in-person visit, at least four contact attempts will be made before the case is coded as a non-contact.

> **Guideline 9.3.3** In cases where the first attempt to contact respondents is an in-person visit, the following should be incorporated into the contact strategy:

> - For efficiency purposes, all components of the interview should, ideally, be completed in the same visit. However, if the interviewer is unable to contact the sampled respondent during the first attempt, s/he should query another member of the household or contact a neighbour to establish a time when the respondent is likely to be home

> - Contact attempts after the first attempt will be scheduled either 1) according to the information received during the first contact attempt or 2) at different times of the day and on different days of the week, including at least one weekend and one evening visi.

Standard 9.3.4 For countries that initially contact respondents by telephone, at least seven attempts will be made to contact a respondent and schedule an interview before the case is coded as a non-contact.

> **Guideline 9.3.4** In cases where the first attempt to contact respondents is by telephone, the following should be incorporated into the contact strategy:

> - If, during the first attempt, the interviewer is able to contact a household member but not the respondent, the interviewer should query the household member to establish a time when the respondent is likely to be home and should schedule a call back accordingly

> - Contact attempts after the first attempt will be scheduled either 1) according to the information received during the first contact attempt or 2) at different times of the day and on different days of the week

Standard 9.3.5 All PIAAC interview components – the background questionnaire, the direct assessments, and any international or national options – must be conducted in person.

Standard 9.3.6 The interviewer must thoroughly document each contact attempt with the household or respondent in a Record of Contact. Interviewers must enter Record of Contact information each time a contact attempt is made to a selected household, including the attempt that results in a completed interview.

> **Guideline 9.3.6A** The information to be documented for each contact attempt should include visit number, day, date, time, contact mode and outcome, at a minimum.

> **Guideline 9.3.6B** Contact attempt information must be documented either in hard-copy format or through an automated component of the management system.

> **Recommendation 9.3.6** If the contact attempt information is documented through an automated programme, the information should be available to the supervisor, who can review contact data and determine how to proceed with hard-to-contact cases.

Standard 9.3.7 The interviewer must thoroughly document information on each case that receives a non-interview disposition code because of refusal or other nonresponse (*i.e.* vacant dwelling, maximum calls, physical/mental disability, unavailable during field period, etc.).

> **Guideline 9.3.7A** The information collected on non-interview cases should include, at a minimum:

- Demographic data on the person who refused

- Strength of refusal

- Problems encountered

- Comments

- Likelihood of conversion

> **Guideline 9.3.7B** Non-interview data must be documented either in hard-copy format or through an automated component of the management system.

Quality Control Procedures

243.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide a description of the proposed contact strategy for data collection.

244.   During the survey planning and data collection period, countries will be required to provide, as part of the National Monitoring Report, a summary of contact efforts. The information to be provided should include the distribution of contact attempts by time period (*i.e.* morning, afternoon, evening, day of week), average number of contacts according to whether or not contact was made, number of non-contacts by region and by interviewer, and other relevant details.

9.4 INSTRUMENT ADMINISTRATION

Purpose

245.   To specify the data collection procedures for PIAAC in order to ensure consistency in obtaining respondent information and to minimise the risk of bias that might be introduced if different data collection methods are used by participating countries.

Rationale

246.   If the data collection procedures are not the same for all participants, bias could be introduced; *i.e.* the data collection procedures might affect the quality of the respondents' answers.

Standards, Guidelines and Recommendations

Standard 9.4.1 The PIAAC interview consists of the following sequentially administered components:

- Background questionnaire (BQ)

- Direct assessment of cognitive skills

The following international options may also be implemented:

- Job requirements approach module (JRA)

- Reading component skills

- Problem solving in technology-rich environments

Guideline 9.4.1A All components of the interview should be administered in the same visit. In extenuating circumstances, the questionnaires and the assessments may be administered in separate sessions to accommodate family concerns or crises, but interviewers should not schedule return visits to complete instruments that were broken off before completion.

Guideline 9.4.1B The operating/management system on each interviewer's laptop computer must control and enforce the order in which the instruments are administered.

Recommendation 9.4.1 The interview should be completed in the respondent's home. However, if the respondent prefers, the interview may be conducted at a neutral location such as a library, community centre or office.

Standard 9.4.2 Countries for which the sample design involves the sub-selection of individuals within a selected household will require a set of questions (hereafter called screening questions) to identify the target population members within a selected household and to facilitate the random selection of one or two persons within the household.

Guideline 9.4.2A If screening questions are necessary to select a respondent, a separate screening instrument should be developed, in either hard-copy or automated format.

Guideline 9.4.2B The screening questions must include all required sampling criteria, such as the name, age or date of birth, gender, and race/ethnicity of all household members.

Standard 9.4.3 The computer-assisted interviewing method developed by the PIAAC Consortium must be used for the BQ/JRA. The direct assessments should be available in both paper-and-pencil and computer-assisted formats, consistent with the psychometric assessment design specified in Section 4.6.

Standard 9.4.4 The BQ/JRA and the direct assessments and any international or national options must be administered to the selected individual; no substitution is permitted.

Standard 9.4.5 Proxy respondents may not complete the direct assessments. (See Section 4.4.)

Standard 9.4.6 Interviewers must use the specific auxiliary/stimulus materials required during the interview.

Standard 9.4.7 Instruments must be administered in all official languages as determined by each country, with data collection staff appropriately trained and fluent in the language of administration.

Quality Control Procedures

247.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide the screening questions used to identify the target population and select persons within a household. They will also be required to specify the method and mode of data collection for each stage of the interview process.

248.   During the survey planning and data collection period, countries will be required, as part of the National Monitoring Report, to specify the screening items used, as well as the method and mode of data collection for each instrument.

9.5 PROMOTING SURVEY PARTICIPATION AND OBTAINING RESPONSE RATES

Purpose

249.   To minimise the possibility of nonresponse bias and improve the overall quality of the survey data.

Rationale

250.   Whenever there is any nonresponse to a survey, there is a possibility that bias may exist in the survey results. Although this bias can occur whenever there is any nonresponse, the risk of such an occurrence increases as the response rate decreases, *i.e.* as the number of nonrespondents increases. Therefore, each country should make all reasonable efforts to increase response rates.

Standards, Guidelines and Recommendations

Standard 9.5.1 Each country should develop a "best practices" strategy for maximising response rates.

   Guideline 9.5.1A The following minimum strategy will be used by each participating country:

- Hire field staff with the experience and skills that will make them successful in convincing people to co-operate. (See Section 7.3.

- Send advance survey information, such as a letter and brochure, to respondents. (See Section 9.2.) The advance materials should include the study's website and toll-free number, so recipients can access more information about the study

- Train interviewers on the importance of the study and the benefits of participation

- Train interviewers on the importance of the initial contact with the respondent (*i.e.* how to make the best initial presentation/impression)

- Train interviewers in techniques to obtain the co-operation of individuals who initially refuse or are reluctant to participate in the survey. (See Section 8.4.)

- Train interviewers to develop effective work plans that minimise travel costs and time

- Train supervisors and interviewers on the importance of obtaining high response rates, which are critical to obtaining high-quality data and reducing bias

- Implement the contact procedures outlined in Section 9.3, which call for varying contacts at different times of the day and on different days of the week

- Train supervisors to provide training and feedback to interviewers throughout the field period

- Monitor fieldwork closely at every level

- Train supervisors on reassignment strategies for potential refusals, actual refusals and any form of nonresponse

Guideline 9.5.1B Interviewers should clearly display an identification badge containing their picture and signature, the official study logo, and other elements.

Recommendation 9.5.1A To encourage respondent participation, countries should use some form of an incentive. (See Section 3.8.)

Recommendation 9.5.1B Countries should document any special approaches used to reduce nonresponse, so that analysts can correctly interpret the data.

Standard 9.5.2 Interviewers must attempt contact with each sampled household, even those in potentially dangerous areas or locked buildings.

Guideline 9.5.2A Countries must develop a package of materials tailored to apartment managers. These materials should include information on PIAAC, as well as sources for confirming the legitimacy of the study, and should be distributed as needed in the field.

Guideline 9.5.2B After repeated unsuccessful attempts by the interviewer to enter a secure building, the regional supervisor must contact the building management to explain the importance of PIAAC and to try to gain co-operation.

Guideline 9.5.2C For locked buildings, strategies such as criss-cross directories and the Internet may be used to obtain respondents' telephone numbers, in order to make initial contact by telephone.

Guideline 9.5.2D After the interviewer has made unsuccessful attempts to contact the sampled unit, s/he should contact a neighbour to identify the best time and day to contact the household or unoccupied dwellings. The names, addresses and telephone numbers of the neighbours should be collected as a quality control measure.

Recommendation 9.5.2 Options should be available to ensure an interviewer's safety in potentially dangerous areas. Interviewers should be permitted to hire an escort to accompany them while the interview is being conducted. In addition, respondents may be asked to come to an alternative location, such as a library, shopping centre or fast food restaurant.

Standard 9.5.3 All countries must implement effective refusal conversion strategies.

Guideline 9.5.3A Special letters should be designed for refusals or uncooperative respondents. Several versions of the letters can be developed and tailored to the specific circumstance (*e.g.* respondents who are too busy, respondents requiring a large font, respondents concerned about being given a sales pitch). All letters should include the study's website and toll-free number.

Guideline 9.5.3B Interviewers must complete a non-interview report form for all cases of nonresponse. The information collected on these forms will facilitate the development of a nonresponse strategy and allow the supervisors to plan their refusal conversion strategies more effectively.

Guideline 9.5.3C Follow-up of refusals or uncooperative respondents may be conducted by a senior interviewer or the regional supervisor. Special travelling interviewers with demonstrated skills in gaining co-operation and nonresponse conversion may also be used.

Recommendation 9.5.3A Refusal conversion letters should be sent by priority or registered mail, to increase the likelihood of the materials being read and to reinforce the legitimacy and importance of the study.

Recommendation 9.5.3B During the data collection, countries should develop and implement an additional brochure focusing on issues of concern that were not addressed at the start of the study.

Quality Control Procedures

251.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide details of the proposed response rate strategy.

252.   During the survey planning and data collection period, countries will be required to provide, as part of the National Monitoring Report, information on the steps that have been proposed or taken to ensure that the specified response rate targets are met.

9.6 STUDY MANAGEMENT SYSTEM/SURVEY CONTROL FILE

Purpose

253.   To enable the administration of the automated survey instruments and support the operational aspects of the data collection effort.

Rationale

254.   Given the scope and complexity of PIAAC, each country must develop an automated study management system to enable timely management, conduct and monitoring of data collection. The system must facilitate the administration of the automated instruments, produce reports that are integral to the review and management of the data collection effort, and assist regional supervisors in their day-to-day operational tasks, such as case assignment and transfer and assignment of result codes.

Standards, Guidelines and Recommendations

Standard 9.6.1 Each country is responsible for developing an automated management system that can be used to conduct the PIAAC interview.

Standard 9.6.2 The management system developed by each country must be able to support the functions necessary for supervisory staff to manage the day-to-day operations of a data collection effort.

> **Guideline 9.6.2** Each country's management system must be able to perform the following survey operations functions, at a minimum:
>
> - Case assignment
>
> - Case transfer/reassignment
>
> - Case reset to prior state
>
> - Removal of data from the laptop computer
>
> - Production of reports for the PIAAC Consortium
>
> **Recommendation 9.6.2A** Each country's management system should include a mechanism for documenting information related to each contact attempt that does not result in a completed interview. (See Section 9.3.)
>
> **Recommendation 9.6.2B** Each country's management system should include a mechanism for tracking interviewers' time and expense data (weekly hours, weekly expenses, weekly mileage and cost per completed interview).

Standard 9.6.3 The management system developed by each country must be able to support the production of automated reports during the data collection period. (See Section 9.8.)

> **Recommendation 9.6.3** Each country's management system should contain data for use and reference by the interviewer or supervisory staff, as well as data elements for use in the production of data

collection reports. (See Section 9.8.) Each management system should contain the information listed below:

- Case ID

- Geographic area (*i.e.* primary sampling unit, region, segment)

- Dwelling information (street address, city, state and ZIP Code)

- Case-level status and disposition code

- Task-level status and disposition code

- Date the interview was finalised or status date

- Task type (interview component)

- Interviewer name and ID

- Validation status

- Language of administration

- Assignment date and type (original vs. transfer)

- Date and time of inbound and outbound data transmissions

- ID number(s) of paper assessment booklet(s)

- Status of paper assessment booklet

- Date that hard-copy materials were returned to the survey institute by the interviewer

Standard 9.6.4 Each country must develop a survey control file to be used for the initial loading of data into the study management system.

Recommendation 9.6.4 Depending on the sampling technique used by each country, the content of the survey control file will vary. The file should include all data that must be preloaded into the system before data collection, such as participant names, addresses, sampling variables and cases pre-selected for validation.

Quality Control Procedures

255.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide the specifications for their study management system and the proposed layout and contents of their survey control file.

256.   During the survey planning and data collection period, countries will be required to document, as part of the National Monitoring Report, the specifications and capabilities of their study management system, as well as the layout and contents of their survey control file.

9.7 DISPOSITION CODES

Purpose

257.   To ensure that all countries apply identical disposition codes and implement them according to the standard definitions.

Rationale

258.   The use of a standard set of disposition codes is integral to the data collection, processing, delivery and analysis components of PIAAC, as well as the calculation of critical measures such as response rate and completion rate.

Standards, Guidelines and Recommendations

Standard 9.7.1 In assigning status codes at both the instrument and case levels, all countries must implement the list of approved PIAAC disposition codes shown in Tables 9-1 to 9-3.

Table 9-1.   Disposition Codes for PIAAC Screener

Description	Code
Complete – 1 sample person selected	1
Complete – 2 sample persons selected	2
Partial complete[12]/breakoff	3
Refusal – household member	4
Refusal – gatekeeper	5
Language problem	7
Learning/mental disability	9
Hearing impairment	12
Blindness/visual impairment	13
Speech impairment	14
Physical disability	15
Other disability	16
Other (unspecified), such as sickness or unusual circumstances	17
Complete – no eligible sample persons	19
Address not a dwelling unit	28
Unable to locate dwelling unit	20
Maximum number of calls	21
Dwelling unit under construction	22
Temporarily absent/unavailable during field period	24
Vacant dwelling unit	26
Duplication - already interviewed	27

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[12] A partial completed case is a case in which the participant completed the background questionnaire/job requirements approach but refused to continue to the direct assessment (which will affect response rates).

Table 9-2. Disposition Codes for PIAAC Background Questionnaire (BQ) and Job Requirements Approach (JRA) Module

Description	Code
Complete	1
Partial complete/breakoff	3
Refusal – sample person	4
Refusal – other	5
Language problem	7
Reading and writing difficulty	8
Learning/mental disability	9
Hearing impairment	12
Blindness/visual impairment	13
Speech impairment	14
Physical disability	15
Other disability	16
Other (unspecified), such as sickness or unusual circumstances	17
Death	18
Maximum number of calls	21
Temporarily absent/unavailable during field period	24
Ineligible (for single-stage design)	25
Duplication – already interviewed	27

Table 9-3. Disposition Codes for PIAAC Core and Main Assessments

Assessment	Description	Code
Core	Complete – passed Core	1
Core	Partial complete/breakoff	3
Core	Refusal – sample person	4
Core	Refusal – other	5
Core	Language problem	7
Core	Reading and writing difficulty	8
Core	Learning/mental disability	9
Core	Hearing impairment	12
Core	Blindness/visual impairment	13
Core	Speech impairment	14
Core	Physical disability	15
Core	Other disability	16
Core	Other (unspecified), such as sickness or unusual circumstances	17
Core	Death	18
Core	Maximum number of calls	21
Core	Temporarily absent/unavailable during field period	24
Core	Duplication – already interviewed	27
Core	Complete – failed Core	29

Table 9-3. Disposition Codes for PIAAC Core and Main Assessments (continued)

Assessment	Description	Code
Main	Complete	1
Main	Partial complete/breakoff	3
Main	Refusal – sample person	4
Main	Refusal – other	5
Main	Language problem	7
Main	Reading and writing difficulty	8
Main	Learning/mental disability	9
Main	Hearing impairment	12
Main	Blindness/visual impairment	13
Main	Speech impairment	14
Main	Physical disability	15
Main	Other disability	16
Main	Other (unspecified), such as sickness or unusual circumstances	17
Main	Death	18
Main	Maximum number of calls	21
Main	Temporarily absent/unavailable during field period	24
Main	Duplication – already interviewed	27

Recommendation 9.7.1 If contact does not result in a final outcome for a case, countries may choose to assign an interim status code that summarises the status of the case until a final result is achieved. All interim codes can be used for the screener, BQ/JRA and Core and Main assessments. Recommended interim status codes appear in Table 9-4.

Table 9-4. Suggested PIAAC Interim Status Codes

Interim code	Description
AP: Call back – appointment	You have obtained a firm appointment to return to the dwelling unit at a specific time.
CB: Call back – no appointment	You have made contact and obtained some idea of when to return to the household but have not established a definite appointment. For example, the household's babysitter has told you that the parents are usually home by 6:30 on weekdays.
NH: Not at home	No one is at home at the time of contact.
RB: Initial refusal	A household member refused to participate or broke off the interview before it was completed.
OT: Other	Any other situation that requires follow-up, such as sample person's illness, a language difficulty, a dwelling unit you cannot locate, or a locked structure.
IL: Illness/disability	The sample person is unable to complete the BQ/JRA or the assessment because of an illness or disability.

Standard 9.7.2 Countries may develop different or additional interim and final disposition codes for their own purposes, but the final data delivery must map all disposition codes back to the list of approved PIAAC codes.

Quality Control Procedures

259.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide a full list and description of the disposition codes to be used for each instrument.

260.   During the survey planning and data collection period, countries will be required to document and describe, as part of the National Monitoring Report, the disposition codes to be used for each instrument, focusing on those not specified by the PIAAC Consortium.

9.8 DATA COLLECTION REPORTS

Purpose

261.   To allow the monitoring of key components of the data collection process.

Rationale

262.   The continuous examination of the data collection effort by various levels of the project management staff is integral to the success of PIAAC. Up-to-date automated reporting systems will be crucial to the management team's ability to regularly track the progress of fieldwork.

Standards, Guidelines and Recommendations

Standard 9.8.1 Each country must develop automated reports to effectively monitor the data collection. The reports must focus on the completion status of cases and the progress made to finalise work.

   Guideline 9.8.1A The reports must be produced based on the data collected by and stored within the country's management system.

   Guideline 9.8.1B The reports must be available to all members of the project team. The ability to hierarchically filter the report contents by level of project management (field director, regional supervisor, etc.) should be part of the report design.

   Guideline 9.8.1C The reports must reflect the current status of the work and be continually updated as data are transmitted by interviewers and supervisors.

   Guideline 9.8.1D The reports must show the breakdown of cases by various disposition codes, allowing supervisory staff to determine the number of cases that have complete, pending, interim refusal and other disposition codes. This breakdown should be available at different reporting levels, such as nation, region and interviewer levels.

   Guideline 9.8.1E A sample yield report must be developed to allow the monitoring of the demographic characteristics of the sample.

   Guideline 9.8.1F Countries must develop a mechanism to review unassigned cases by geographic area, to aid in the assignment of cases.

   Guideline 9.8.1G To permit the review of project costs, countries must develop a report that assesses interviewer costs for hours worked, miles driven and other expenses.

   Guideline 9.8.1H To track the frequency with which interviewers transmit data, countries must produce a report that describes data transmissions, including the most recent time and date of inbound and outbound transmissions.

   Guideline 9.8.1I To review the status of the validation efforts, countries must produce a validation report, including the validation rate by field interviewer and validation outcome.

Quality Control Procedures

263.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide a full list and description of the automated reports that will be produced in support of the data collection effort.

264.   During the survey planning and data collection period, countries will be required to provide, as part of the National Monitoring Report, a full list and description of the automated reports that will be produced in support of the data collection effort, including the purpose of the report, its content, the source of the data and the audience for the report.

9.9 QUALITY CONTROL OF FIELDWORK

Purpose

265.　To ensure that PIAAC data are of the highest quality.

Rationale

266.　Various forms of quality control measures must be implemented throughout the data collection period to ensure that the interviewer work is of acceptable quality, to uncover potential problems that may have an impact on the survey data and to provide interviewer feedback.

Standards, Guidelines and Recommendations

Standard 9.9.1 Interviewers must be made aware during training that their work will be monitored.

Standard 9.9.2 Each country must develop and implement procedures to monitor the in-field performance of the interviewers.

> **Guideline 9.9.2A** Each new interviewer and those that were identified as weakest at training must be monitored closely during the early stages of the data collection period, so that potential problems are detected as soon as possible. Monitoring can be done through in-person observation or audiotaping of the interview.

> **Guideline 9.9.2B** Countries should document their quality control procedures, as well as the outcomes of interviewer monitoring (*e.g.* falsification rates).

> **Recommendation 9.9.2** If in-person monitoring is implemented, observations should be conducted by regional supervisors or survey institute staff.

Standard 9.9.3 Each country must develop and implement procedures to verify a minimum of 10% of an interviewer's finalised work, including cases finalised as nonresponse.

> **Guideline 9.9.3A** Interview validation must be conducted to verify that an interviewer has interviewed a sampled individual according to the study procedures.

> **Guideline 9.9.3B** Interview validation must begin very early during the field period so that problems can be addressed immediately.

> **Guideline 9.9.3C** Interview validation should be conducted by supervisory staff over the telephone or in person, using a standardised form developed by the PIAAC Consortium.

> **Guideline 9.9.3D** The supervisor-completed validation form will collect household composition and demographic data, a few key background questionnaire items, and other questions about the interviewer's visit.

> **Guideline 9.9.3E** For households for which no telephone number is available, interview validation can be conducted in person by a senior interviewer, using a standardised form developed by the PIAAC Consortium. This form will be different from the validation form used by supervisors.

Standard 9.9.4 If an interviewer's work is found to be suspect, 100% validation of his/her other cases must be conducted. Any falsified work must be refielded and completed by another interviewer.

Standard 9.9.5 Countries must develop and implement procedures to review tape recordings of each interviewer's work.

> **Guideline 9.9.5** Interviewers will provide the survey institute with tape recordings of at least two full interviews early in the data collection period (perhaps their third and tenth interviews). Supervisors will review the tape recordings, using a standardised form developed by the PIAAC Consortium, and will provide feedback as necessary.

Standard 9.9.6 Countries must develop automated reports that the field supervisor and other project management staff can use to detect interviewer behaviour that might indicate falsification.

> **Recommendation 9.9.6** The automated reports, produced on a weekly basis, should include information such as interview administration length, individual instrument administration time, amount of time between interviews, interviews conducted very early in the morning or late in the evening, and number of interviews conducted per day.

Standard 9.9.7 All interviewers must review their hard-copy materials before finalising a case and returning the materials to the survey institute. Similarly, interviewers must ensure that all automated components have been completed before finalising a case.

Standard 9.9.8 The survey institute must conduct an extensive review of all completed hard-copy materials and automated interview data to ensure that they meet the project standards for data quality.

Standard 9.9.9 The survey institute must develop an automated editing system for reviewing the electronic interview data. The editing system must accommodate the review of data frequencies, the review and suppression of edits, and the coding of "other-specify" responses.

Quality Control Procedures

267.	As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide a description of their proposed procedures for ensuring quality control during the data collection phase of the project.

268.	During the survey planning and data collection period, countries will be required to provide, as part of the National Monitoring Report, a full description of the procedures that will be followed at all stages of data collection and data processing to ensure high data quality.

10. QUALITY CONTROL STANDARDS

THIS SECTION IS PENDING.

11. DATA CAPTURE STANDARDS

11.1 MANUAL DATA ENTRY, VERIFICATION AND RELIABILITY

Purpose

269.   To ensure that the capture of data from the scoring sheets derived from the paper-and-pencil assessment instruments (see Section 11.3) is conducted using uniform methods and is as free of capture errors as possible.

Rationale

270.   In PIAAC, cognitive test instruments will be delivered in either computer-based or paper-and-pencil mode. Scoring sheets will be derived from the paper-and-pencil instruments. (See Section 11.3.) Due to the nature of the stimulus and response formats, the rotation design, the need to classify different types of missing responses, and the scoring procedures used, a manual method of capturing data into computer files will be used. Manual data entry and full verification will be both feasible and advisable because it is expected that few cases will require paper-and-pencil administration of cognitive test instruments.

Standards, Guidelines and Recommendations

Standard 11.1.1 All PIAAC scoring sheets will be manually captured following specifications in the corresponding operational manual, scoring guides and international record layout.

Guideline 11.1.1A The participating countries will be responsible for the capture of data from scoring sheets derived from the paper-and-pencil instruments, under the supervision of a National Data Processing Manager. The PIAAC Consortium will provide support for this activity in the form of software, manuals, international record layouts and mandatory training for data managers.

Guideline 11.1.1B All data capture operators should be thoroughly trained using mock materials. Data must be entered exactly as values appear on the instruments, that is, without any corrections, unjustified interpretations or imputation. Before data capture, data managers must resolve any ambiguity or lack of clarity on the scoring sheets as a result of the scoring task.

Guideline 11.1.1C Appropriate logistics and tracking procedures must be implemented to ensure that all materials are fully captured. Until data cleaning and editing have been completed and the data have been explicitly accepted by the PIAAC Consortium, the paper instruments and corresponding scoring sheets must be securely stored and archived such that they can be accessed and retrieved using their unique identifier (*i.e.* person ID).

Guideline 11.1.1D Participating countries are expected to use the software and procedures provided by the PIACC Consortium for data capture from scoring sheets, which will help to ensure that the operation is in full compliance with PIAAC standards and quality criteria. Manual data capture errors and mistakes (usually key-entry operator errors) are comparatively easy to identify, control and reconcile. Automated scanning methods have been found to introduce problems that differ from those

created by manual data capture methods. Given the procedures in PIAAC and the goal of achieving a high quality of data capture, the use of an optical scanning method or alternative data capture system is not encouraged and must be approved by the PIAAC Consortium prior to implementation.

Standard 11.1.2 To achieve maximum reliability, data management staff will conduct 100% verification of all scoring sheets (*i.e.* they will be re-entered by a second key-entry operator), followed by full reconciliation of any identified inconsistencies by consulting the original paper materials.

Guideline 11.1.2 Data capture will be performed twice, ideally by two different operators, to facilitate the detection of systematic or incidental data entry errors. This implies that a minimum of two individuals should be assigned to enter data from scoring sheets, regardless of the volume of work.

Quality Control Procedures

271.   The data entry solution provided by the PIAAC Consortium will require an entry for each applicable variable and restrict the entry to valid and missing values defined in the corresponding record layout and scoring guides. Key-entry operators will be notified if they attempt to use an already existing ID or enter a value that is undefined in the record layout and scoring guides.

272.   The PIAAC data integration software (see Section 12.2) will 1) verify that 100% double data entry was performed and 2) identify any inconsistencies between the two sets of data. Reports will facilitate the look-up of original scoring sheets and instruments and the correction of values.

273.   Participating countries will be required to report on the manual data capture operations in the National Survey Design and Planning Report and the National Monitoring Report.

11.2 CODING

Purpose

274.   To ensure that the coding of items in the background questionnaire is performed in a uniform way within and across countries and with an acceptable quality.

Rationale

275.   Participating countries must take steps to ensure that errors are minimized during the manual coding of data.

Standards, Guidelines and Recommendations

Standard 11.2.1 To facilitate comparability in data analysis, each PIAAC country will be required to map its national dataset into a highly structured, standardised record layout. In addition to specifying the position, format and length of each field, the international record layout will include a description of each variable and indicate the categories and codes to be provided for that variable. Upon receiving a country's file, the PIAAC Consortium will perform a series of range checks to ensure compliance with the prescribed format and will run flow and consistency edits on the file. When anomalies are detected, countries will be notified of the problem and asked to submit cleaned files.

Standard 11.2.2 The following codebooks will be used to code education, occupation and industry information from the background questionnaire.

- The PIAAC Consortium will develop a monitoring document (the Background Questionnaire Adaptation Sheet) that countries can use to provide detailed information on national translation and adaptation issues. This tool will be used to monitor and, if appropriate, approve country-specific additions to the background questionnaire or job requirements approach module.

- The 1997 International Standard Classification of Education (ISCED) will be used to code the education variables. If ISCED 2009 is available at the time of the field test, this will be used instead of ISCED 1997. Countries are required to deliver both the code in the national classification and the corresponding international code. Respondent education will be coded using the codes shown in Table 11-1A.

**Table 11-1A.   PIAAC Education Codes and Corresponding Codes
from the ISCED**

PIAAC Code	ISCED Code
01	No formal education or below ISCED 1
02	ISCED 1
03	ISCED 2A
04	ISCED 2B
05	ISCED 2C
06	ISCED 3A
07	ISCED 3B
08	ISCED 3C, < 2 years
09	ISCED 3C, $\geq$ 2 years
10	ISCED 4A
11	ISCED 4B
12	ISCED 4C
13	ISCED 5A, bachelor's degree
14	ISCED 5A, master's degree
15	ISCED 5B
16	ISCED 6

276.   For coding the educational attainment of parents and partners, a distinction will be made in coding the first three levels, as shown in Table 11-1B.

**Table 11-1B.   PIAAC Education Codes and Corresponding Codes from the ISCED for Coding
Parent and Partner Education**

PIAAC Code	ISCED Code
01	ISCED1 and 2
02	ISCED 3 + 4
03	ISCED 5 + 6

- The minor group (three-digit) codes from the 2008 International Standard Classification of Occupations (ISCO-08) will be used to code the occupation of the respondent. The occupation of the respondent's parents will be coded using the two-digit submajor group.

- Three -digit codes from the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3.1, will be used to code the sector in which the respondent is working. If the fourth revision of the ISIC (currently in draft) is available at the time of the field test, this will be used instead of Revision 3.1.

- Countries are required to incorporate the respondent's address into the national community code and store this in the national case management system. This information will be used to arrive at derived variables such as Nomenclature of Territorial Units for Statistics (NUTS) region and size of community. The type of derived variables will be decided later. The international data file will include only the derived variables.

Standard 11.2.3 Data that have been manually coded will be 50% verified by another coder. The average error rate for manually coded data must not exceed 6%.

Guideline 11.2.3A Each country should train approximately five coders. These coders should preferably have extensive experience in coding education and industry/occupation data from censuses or other large-scale surveys. Training materials should consist of a master set of descriptions with associated expert codes for the data to be coded. By the end of the coder training programme, the coder error rate should not exceed 6%.

Guideline 11.2.3B Some countries may opt to utilize software for automated coding. However, since automated coding software is rarely able to successfully code 100% of the data, a manual coding operation will still be necessary. In this case, fewer manual coders may be required.

Quality Control Procedures

277. Participating countries will provide a description of their coding system and coding quality control procedures.

278. The PIAAC Consortium will provide the international standard codebooks to be used for coding education, occupation and industry data.

279. In countries that use national classifications for coding education, occupation and industry data, the country's national statistical institute will check the conversion of the national classification to the international classification.

280. Countries will check the quality of their coding of the respondent's highest educational level, occupation and industry against the distribution in the most recent Labor Force Survey or equivalent survey.

281. The PIAAC Consortium will provide the international record layout specification containing the codes for each variable.

11.3 SCORING PAPER-AND-PENCIL INSTRUMENTS

Purpose

282.   To ensure that the scoring of paper-and-pencil instruments is consistent across all scorers within a country and between countries.

Rationale

283.   Accurate and reliable scoring is a key component of quality control for PIAAC. Scoring is required to determine whether respondents have correctly answered the questions in the paper-and-pencil cognitive instruments. Rescoring is required as a quality assurance measure to determine whether the scoring rubrics have been applied consistently by every scorer within the country and without bias across the country. The scoring procedures for the paper-and-pencil cognitive instruments should be set up to achieve accuracy by monitoring reliability throughout the scoring period. Achieving the goal of comparability depends on the equivalence of scoring within and between countries.

284.   During the field test, participating countries will check the consistency of scoring by having a second scorer rescore 100% of instruments. This rescoring operation must achieve a within-country inter-rater agreement of at least 95%. Inter-rater reliability procedures are implemented to document the degree to which the same scores are given to the same responses, regardless of the scorer. Additionally, item-level reliability studies will identify items that the scorers had difficulty in scoring consistently. Items with low inter-rater reliability will be further examined for possible ways to improve scoring accuracy through improved translation, instruction and/or training for the main study. This examination may also indicate that a particular scorer's performance accounted for lower rescore reliability.

285.   During the main study, reliability studies will be conducted to check the equivalency of scoring standards across countries in addition to the consistency of scoring within each participating country. Within-country inter-rater reliability studies will be implemented by have a second scorer rescore either 300 of each booklet in each national language or 100% of the booklets, whichever is less. This rescoring operation must achieve a within-country inter-rater agreement of at least 95%. To generate enough data to evaluate the accuracy of scorers, each scorer must rescore 125 of each of the literacy and numeracy booklets. For the main study, if a scorer or scoring of any item is found to be systematically unreliable, the lead scorer should review the items scored by that scorer or the items scored inconsistently and correct all errors.

286.   In addition to the within-country study in the main study, a cross-country reliability study will be implemented to examine systematic scoring bias across countries. At least two bilingual (English and a national language) scorers will score international English booklets to ensure the equivalence of scoring across countries. The scores of the two bilingual scorers will be compared and evaluated against the master scores for accuracy. Inaccurate scores should be investigated, and country scores may have to be corrected to reflect the investigation, depending on the cause of the inaccuracy.

Standard 11.3.1 To achieve the goal of comparability, each country must score all paper-and-pencil cognitive instruments in a manner that is consistent within and across countries.

> **Guideline 11.3.1A** Scorers will use scoring sheets designed to capture the scored responses from the paper-and-pencil cognitive items.
> **Guideline 11.3.1B** Scoring must be performed in a centralised location, as training, quality control and communication are more efficient when all scorers are working in the same location.

Quality Control Procedures

287.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, on the status of scoring operations, including scorer reliability. As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document all aspects of their scoring operations.

11.4 QUALIFICATIONS, HIRING, TRAINING AND SUPERVISION OF SCORING STAFF

Purpose

288.   To ensure that the scoring staff is well-qualified, are assigned manageable workloads and receive adequate training and supervision.

Rationale

289.   Successful scoring operations are crucial to achieving good data quality in PIAAC. The number of scorers hired and trained must be sufficient both to allow the scoring operations to be conducted in a prescribed amount of time and to ensure that there are enough scorers to satisfy the rescoring requirements. Scorer training should follow the training developed by the PIAAC Consortium, to ensure that scorers understand the rubrics and can apply them consistently. At least two scorers, including the lead scorer, must be proficient in English and in the language in which they are scoring, to facilitate the rescoring procedures.

Standards, Guidelines and Recommendations

Standard 11.4.1 The number of qualified scorers hired and trained by each country must be sufficient so that the scoring can be completed within three to four weeks.

Guideline 11.4.1A Each country will employ a sufficient number of scorers (a minimum of three) so that the scoring can be completed within 3 to 4 weeks.

Guideline 11.4.1B Scorers must be proficient in English as well as the language in which they are scoring task booklets. They should preferably be university graduates and must have at least a high school qualification. Scorers must be able to work in a team environment on the same schedule and in the same location. Each scorer should be expected to score, on average, 12 booklets per hour.

Guideline 11.4.1C Scorer training will be given by each country and will follow the training developed by the PIAAC Consortium. Scoring training will involve a minimum of three days of in-class training and two days of practice scoring. Scorers must be proficient in English and in the language in which they are scoring.

Guideline 11.4.1D Each country will send a lead scorer to the scoring training to be provided by the PIAAC Consortium at a National Project Manager meeting. This lead scorer will be responsible for training the country's team of scorers, supervising their work and communicating any scoring-related issues to the PIAAC Consortium. The lead scorer will monitor each scorer's performance and overall scoring on a daily basis. The lead scorer must check 10% of each scorer's work for accuracy and retrain scorers who are not performing as necessary.

Guideline 11.4.1E The lead scorer will subscribe to the PIAAC scoring listserv and will submit any scoring questions to the listserv for resolution by the PIAAC experts.

Recommendation 11.4.1 Each country must develop a training package for scorers, which will consist of an overview of the survey and training manuals based on the manuals and materials provided by the PIAAC Consortium.

Quality Control Procedures

290.	As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to document their strategies for hiring and training scorers.

291.	During the survey planning and data collection period, countries will be required to report on the number of scorers hired and their qualifications. The documentation should include the number of scorers who were trained as well as the number released after training and the reasons for their termination.

292.	A copy of the training materials for each country in each language must be submitted to the PIAAC Consortium. Any deviations from the scoring procedures developed by the PIAAC Consortium must be documented and reported.

293.	Each country should also include in its field manual a description of the procedures used to monitor and support the scorers.

12. DATA FILE CREATION STANDARDS

12.1 PROCESSING AND RECORD LAYOUT

Purpose

294.   To ensure that each country creates the necessary survey files—including sampling, status and disposition information, questionnaire and assessment responses, scores, codes, and weights—in the format and layout required for processing and analysis on the international level.

Rationale

295.   The PIAAC data will originate from a variety of sources (*e.g.* computer-based background questionnaires and cognitive assessments or paper-based cognitive instruments). Most of the PIAAC data will be collected on the TAO platform and will be directly integrated into the country's database, using the PIAAC Consortium-provided integration software. (See Section 12.2.) The sample design and survey control data created by the country's case management system (see Section 9.6) must be mapped to the format and international record layout required by PIAAC prior to integration into the country database.

Standards, Guidelines and Recommendations

Standard 12.1.1 Each country will create or transform the necessary sample design/survey control files according to the International File Layout specified by the PIAAC Consortium and in the format required for integration.

> **Guideline 12.1.1** The participating countries are responsible for ensuring that the survey files including case information are created according to the internationally defined record layout. National Project Managers and National Data Managers should review the international layout carefully prior to implementation of their national case management systems to ensure that their survey data can be unequivocally mapped to the internationally required fields, codes and formats.

Quality Control Procedures

296.   The PIAAC Consortium will review each country's sample design/survey control file format and layout prior to implementation to ensure that it can conform to international requirements. (See also Section 9.6.) Deviations from the prescribed record format must be reconciled before the data can be integrated for further processing.

297.   The data integration software (see Section 12.2) will verify the structure and values of the required files during import.

298.   In the National Survey Design and Planning Report, the participating countries will be required to report on the processing and conversion from their case management system to the internationally required structure.

12.2 DATA INTEGRATION

Purpose

299.   To ensure that PIAAC data from all sources are reliably and consistently integrated.

Rationale

300.   In PIAAC, the structure of the data is complex and data will originate from a variety of sources:

- Sample design/survey control files from the country's case management system (*e.g.* ID numbers, selection probabilities, disposition codes);

- Assessment design meta-data from the TAO platform *(e.g.* random assignments, branching and redirection to paper-and-pencil mode, sequence of adaptive measures);

- Background questionnaire (BQ) and job requirements approach (JRA) module responses from the TAO platform;

- Cognitive assessment responses and scores for automatically scored items from the TAO platform;

- Behavioural and audit information from the TAO platform (*e.g.* time taken, mouse activity, hard/soft edit checks and resulting interviewer edits);

- Scoring of paper-and-pencil assessment booklets (main and reliability scoring);

- Scoring of manually scored problem-solving items (main and reliability scoring);

- Coding using the International Standard Classification of Education (ISCED), the International Standard Classification of Occupations (ISCO) and the International Standard Industrial Classification of All Economic Activities (ISIC) schemes (main and reliability coding).

301.   The corresponding databases and files must be matched and checked for structural consistency using unique record identifiers. Because of the complexity of the different sources of data in PIAAC, and given that most data will originate from the TAO platform, it is imperative that the PIAAC Consortium provide software so that the national databases can be reliably built and verified on a continuous basis as the survey progresses and so that data can be delivered on time.

302.   "Integration," as used below, refers to the structural assembly of the above-mentioned sets/sources of variables to form the country database. "Importing," as used below, refers to the incremental addition of data for individual cases or sets of cases from a particular source to the country database.

Standards, Guidelines and Recommendations

Standard 12.2.1 All data collected for PIAAC will be imported into a national database using the data integration software provided by the PIAAC Consortium and following specifications in the corresponding operational manuals and international/national record layouts.

> **Guideline 12.2.1A** The participating countries are responsible for data integration, which should be supervised by a National Data Manager. The PIAAC Consortium will provide support for this activity in the form of software, manuals, record layouts and mandatory training for National Data Managers.

> **Guideline 12.2.1B** All data will be verified for structural consistency within and across sources and for agreement with the internationally defined formats and record layouts. Countries are responsible for assuring that sample design and disposition data are recorded for every case and for checking that disposition codes are in agreement with the availability of BQ/JRA and assessment responses. For all applicable cases, countries are responsible for assuring the availability and correct matching of BQ/JRA responses, cognitive assessment responses, scores for auto-scored items, scores for paper-and-pencil assessments, scores for manually scored computer-administered problem-solving items, and ISCED, ISCO and ISIC codes.

> **Guideline 12.2.1C** Data must be imported on a regular and incremental basis as the survey progresses (*e.g.* the ongoing import of data files generated by TAO for each respondent as they are returned from the field by interviewers).

Standard 12.2.2 Any national instrument adaptations, as agreed upon with the PIAAC Consortium, must be reflected in the national record layout.

> **Guideline 12.2.2A** Adaptations to the national context must be reflected in the national record layout before data are imported, based on the corresponding documentation. (See Section 5.2.) For instance, additional values in a BQ multiple-choice question must be reflected in the national record layout and must correspond to the BQ data that are expected to be imported from the TAO platform.

> **Guideline 12.2.2B** The integration of data will follow the adapted national record layout. Any necessary recoding or mapping to re-establish the international record layout will be carried out after all data have been imported and integrated according to the documentation (*i.e.* the Background Questionnaire Adaptation Sheet) agreed upon between the country and the PIAAC Consortium.

Quality Control Procedures

303.   The data integration software provided by the PIAAC Consortium will facilitate the adaptation of the record layout to the national context, the integration and importing of data, and the verification of data accuracy, completeness and structural agreement with the corresponding record layout across data sources. For example, the software will verify that records from the sample design data marked as completed have matching responses for the BQ and assessments.

304.   The PIAAC Consortium will review national adaptations to the BQ/JRA from a data and coding perspective before they are implemented.

305.   The software will have the capability of generating reports that provide an overview of the consistency of the entire database. Each country will be required to generate and review these reports on a regular basis and to conduct a final review before delivering the database to the PIAAC Consortium.

12.3 DATA VERIFICATION

Purpose

306.   To ensure that the national PIAAC database accurately reflects the survey information, the respondents' answers collected in the field and any derived variables.

Rationale

307.   The national database provided to the PIAAC Consortium at the end of the data processing and integration phase will be used in subsequent steps such as weighting, scaling, estimation, analysis and reporting. It is therefore imperative that the final database incorporating all sources has been properly verified and edited to ensure that it is free of data capture errors, so that a reliable database is available for international analysis.

Standards, Guidelines and Recommendations

Standard 12.3.1 Each country will perform verifications of its national database to identify and, if necessary, resolve errors and inconsistencies in the data. Such verifications will be conducted using the data integration software provided by the PIAAC Consortium and in accordance with the specifications in the corresponding operational manuals and record layouts.

Guideline 12.3.1A The verification of the PIAAC database, over and above the verification checks mentioned in the context of integration, includes the following: 1) a unique ID check, 2) a valid value check for nominal/ordinal variables, 3) a valid range check for continuous variables and 4) flow/logical checks for conditional questions.

Guideline 12.3.1B The participating countries are responsible for performing the above-mentioned checks and for making any necessary changes or corrections to the data on a regular basis (*e.g.* weekly) and again before data delivery to the PIAAC Consortium.

Guideline 12.3.1C If systematic or incidental errors are discovered during any of these or additional checks, they will be resolved by replacing the original erroneous value either with a corrected valid value from the original instruments and/or survey documentation or with the appropriate missing value (*e.g.* "not stated").

Guideline 12.3.1D Missing or inconsistent data may be augmented or corrected by consulting survey documentation, by looking up the original responses or by having the interviewer recontact the respondent. Statistical imputation methods must not be used to treat missing data (*i.e.* item and unit nonresponse).

Quality Control Procedures

308.   The data integration software provided by the PIAAC Consortium will generate the reports necessary to carry out the within-country verification as the survey progresses and prior to data submission. The software will further facilitate the production of frequencies to support the review of data.

309.   Following data submission, the PIAAC Consortium will run identical checks to identify any residual issues not previously addressed by the national centre. Additional data verification checks and cleaning logic (*e.g.* for multivariate outliers) will be implemented on the international level and reported to countries for comment and/or correction based on the within- and cross-country analysis.

12.4 DELIVERY

Purpose

310.   To ensure that a single, complete, final and verified PIAAC national database is delivered to the PIAAC Consortium, including all documentation (*e.g.* Background Questionnaire Adaptation Sheets), and that any questions and queries by the PIAAC Consortium are addressed in a timely way.

Rationale

311.   The databases delivered by the national centres form the basis for the PIAAC analysis, reporting and dissemination. It is therefore of utmost importance that the PIAAC Consortium receives a complete database and that any remaining queries or inconsistencies be resolved in a timely way.

Standards, Guidelines and Recommendations

Standard 12.4.1 Each participating country is responsible for delivering a single complete and documented database according to the format specified in the PIAAC operational manuals and following the schedules defined by the PIAAC Consortium for the field test and main study.

Guideline 12.4.1A The delivery of data should follow the adapted national record layout, *i.e.* prior to any necessary recoding or mapping to re-establish the international record layout. Working in close co-operation with the National Project Manager and the National Data Manager, the PIAAC Consortium plans to make necessary structural adjustments following data submission.

Guideline 12.4.1B Any documentation specified in the PIAAC operational manuals or otherwise pertinent to the database must be submitted together with the national database.

Guideline 12.4.1C Data delivery must be made through secure channels (*i.e.* the project's SharePoint site), in a folder to which only the PIAAC Consortium and the country have access.

Standard 12.4.2 The National Data Manager must be authorised to respond to data queries from the PIAAC Consortium for a minimum of three months after database delivery, must be able to respond to queries within three working days and must be able to resolve identified data discrepancies.

Quality Control Procedures

312.   The PIAAC Consortium will verify the completeness of the delivered data, confirm and document the receipt and initiate data processing at the international level.

313.   The participating countries will be required to provide necessary documentation with the data delivery, as well as documentation for any special aspects of the database.

13. CONFIDENTIALITY AND DATA SECURITY STANDARDS

13.1 SAMPLE DESIGN

Purpose

To gather information about the confidentiality rules for each country in a timely manner, to ensure that the sample design data are handled appropriately.

Rationale

Because confidentiality rules vary by country, it is important that countries notify the PIAAC Consortium of any rules affecting the PIAAC data so that issues can be addressed accordingly. The data requested in the PIAAC standards are critical to the study; therefore, any deviation from the data-sharing assumptions will need to be addressed in such a way that data quality is not affected.

Standards, Guidelines and Recommendations

Standard 13.1.1 Each country must provide early indication of any confidentiality rules that limit the data sharing that has been specified in the PIAAC standards in the Sample Design International File Layout and the Weighting International File Layout.

Recommendation 13.1.1 Upon receiving the PIAAC standards, countries should review the national guidelines for maintaining confidential data and present concerns and recommended procedures in a memorandum to the PIAAC Consortium. The PIAAC Consortium will review the memorandum and contact the country representative for further discussion.

In particular, review the Sample Design International File Layout, which requests IDs for the various stages of clustering, including primary sampling units (PSUs), secondary sampling units (SSUs), households and persons. The PSU and SSU IDs are needed to create replicate weights. An alternative to providing PSU and SSU IDs is to create the more anonymous variables variance stratum (VARSTRAT) and variance unit (VARUNIT).

Quality Control Procedures

As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to report any confidentiality rules that limit data sharing.

13.2 INFORMATION TECHNOLOGY

Purpose

314.   To ensure the integrity and confidentiality of all survey data stored either on the Internet or on the laptop computers of participating countries.

Rationale

315.   The PIAAC Consortium has determined that local information technology (IT) processes, and thus the documentation of these processes, should be an internal affair. Therefore, the PIAAC Consortium will specify only standards for internal PIAAC server systems. The security considerations presented here are formulated as recommendations for participating countries. The National IT Co-ordinators are asked to implement similar mechanisms or to implement their own country's security strategy.

Standards, Guidelines and Recommendations

Standard 13.2.1 The PIAAC Consortium will implement security mechanisms in accordance with basic IT security principles regarding data confidentiality, integrity and availability.

Standard 13.2.2 All data available on web services will be accessible only through encrypted connections (HTTPS/SSL) and access control mechanisms. Each user will have only a limited set of user rights.

Standard 13.2.3 All personal data on the Internet-based TAO development servers will be handled according to the recommendations of the German Bureau of Security in Information Technology and the requirements of the German Law of Confidentiality in Information Technology.

Standard 13.2.4 All outbound interactions with the web-based TAO development platform server will be subject to logging mechanisms.

Standard 13.2.5 All traffic coming from the Internet will be checked by the PIAAC Consortium's firewall and intrusion detection system.

Standard 13.2.6 All personnel working with confidential material on the TAO development platform must sign non-disclosure agreements.

Standard 13.2.7 The TAO virtual machine running on the interviewer's laptop computer will not allow administrative control for non-IT personnel. It will operate only in kiosk mode, so that access to the virtualised operating system will be limited to the National IT Co-ordinator and PIAAC Consortium IT personnel.

Standard 13.2.8 The PIAAC Consortium will implement strong folder encryption internally.

Recommendation 13.2.8A Although there has been no final decision on encryption standards, the PIAAC Consortium strongly recommends encrypting the virtual hard drive used in the PIAAC study to prevent analysis of the content block by block (*e.g.* using Truecrypt, Bitlocker, EFS).

Recommendation 13.2.8B The data file exported from the virtual machine to the host system should be encrypted, signed by a digital certificate or placed in an encrypted folder.

Recommendation 13.2.8C All details on encryption and digital signing standards will be decided at meetings with the National IT Co-ordinators and National Project Managers, so that a common standard can be implemented for participating countries.

Quality Control Procedures

316.   Before the field test, countries will be required to document their chosen security standards.

317.   The PIAAC Consortium has assigned two information privacy officials to document and test the handling of sensitive data.

13.3 TRANSLATIONS

Purpose

318.   To maintain the confidentiality of both the source and translated versions of PIAAC assessment instruments.

Rationale

319.   All staff involved in the translation processes, whether hired by the PIAAC Consortium or national centres, must understand the importance of maintaining the confidentiality of both the source and translated versions of PIAAC assessment instruments.

Standards, Guidelines and Recommendations

Standard 13.3.1 All staff who handles PIAAC assessment instruments in the course of the translation process (*e.g.* translators, reviewers, members of national research teams and national expert panels, secretaries) should be made aware that these materials are under embargo and must therefore be kept strictly confidential.

Guideline 13.3.1A All staff working on PIAAC translations must sign a confidentiality agreement and/or affidavit of non-disclosure**.** Annex 13-1 provides a sample confidentiality form that can be adapted to suit national centre requirements.

Guideline 13.3.1B All staff working on PIAAC translations must exchange files containing secure materials exclusively through the secured web-based platform set up and managed by DIPF. (Refer to Section 13.2 for specifications.)

Guideline 13.3.1C If any paper documents containing secure materials (*e.g.* source versions) are distributed to support the translation process, arrangements must be made for these to be returned for secure storage or destruction when they are no longer needed.

Quality Control Procedures

320.   Quality control procedures will verify compliance with the above standard and guidelines.

321.   As part of the National Survey Design and Planning Report process for the field test and main study, countries will be required to outline steps to ensure data confidentiality and security, including steps for the translation process.

13.4 DATA COLLECTION

Purpose

322.   To maintain the confidentiality of PIAAC assessment items and respondent data.

Rationale

323.   It is imperative that confidentiality is maintained throughout the various stages of PIAAC. Project staff, including data collectors, must understand the importance of maintaining respondent confidentiality and data security to ensure that there are no compromises to the data. Furthermore, data collectors should use their knowledge of confidentiality and data security practices to address respondent concerns about those issues.

Standards, Guidelines and Recommendations

Standard 13.4.1 All staff working on PIAAC, including field supervisors and interviewers, must understand confidentiality rules and practices in survey research.

Guideline 13.4.1A All staff working on PIAAC, including field supervisors and interviewers, must sign a confidentiality agreement or affidavit of non-disclosure in which they agree that they will not:

- Reveal the content of any assessment item developed for use on PIAAC.

- Reveal the content of any secure material, including items, from PIAAC.

- Make any improper disclosure whereby a survey respondent or his/her related data could be identified, which includes but is not limited to information collected for PIAAC.

- Permit anyone other than the individuals authorised by the PIAAC Consortium to access PIAAC items, cognitive laboratory materials, data or reports.

- Use or reveal any individually identifying information furnished, acquired, retrieved or assembled by him/herself or others, for any purpose other than statistical or reporting purposes specified by the PIAAC Consortium.

Guideline 13.4.1B PIAAC interviewers must maintain the confidentiality of all respondent information. This includes data collected during an interview, as well as information gleaned from observation, such as observations of the interview setting, the condition of a respondent's home, or interpersonal communications observed between family members.

Guideline 13.4.1C PIAAC interviewers must receive training on confidentiality and informed consent in conducting research. (See Section 8.4.)

Guideline 13.4.1D Authorised users of the PIAAC SharePoint site must abide by the confidentiality statement posted on the PIAAC website (https://piaac.ets.org/sites/piaac/Lists/Announcements/DispForm.aspx?ID=2) and sign a confidentiality agreement and/or affidavit of non-disclosure in which they agree that they will not:

- distribute their password to others;
- permit anyone to have access to PIAAC items, cognitive laboratory materials, data, reports or any other document disseminated through the SharePoint site.

Standard 13.4.2 PIAAC interviewers must be trained on the importance of data security.

Guideline 13.4.2A Interviewers must maintain the security of their laptop computers, keeping passwords separate from the laptop computer and using the laptop computer only for PIAAC-authorised activities.

Guideline 13.4.2B Interviewers must be trained to keep laptop computers and survey materials secure in participant homes, offices, hotel rooms, cars, airports and other locations, to prevent theft.

Guideline 13.4.2C Interviewers must not send secure information or respondent identifiers via non-secure communication.

Guideline 13.4.2D Interviewers must minimise the number of paper records in their possession, by returning materials with respondent identifiers to the survey institute and by shredding outdated materials.

Quality Control Procedures

324.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide the details of their proposed data collection security plan to the PIAAC Consortium.

325.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, the details of the data collection security plan.

13.5. DATA CAPTURE, CODING, SCORING AND PROCESSING

Purpose

326.   To maintain the confidentiality of PIAAC assessment items and respondent data.

Rationale

327.   It is imperative that confidentiality is maintained throughout the various stages of PIAAC. Project staff must understand the importance of maintaining respondent confidentiality and the security of the assessment materials to ensure that there are no compromises to the data.

Standards, Guidelines and Recommendations

Standard 13.5.1 All staff working on PIAAC for data capture, coding and scoring at the national centre or in subcontracted survey organisations must understand and obey confidentiality rules and practices in survey research.

> **Guideline 13.5.1A** All staff working on PIAAC data capture, coding and scoring, regardless of their organisational affiliation, must sign a confidentiality agreement or affidavit of non-disclosure (see also Guideline 1.2E) in which they agree that they will not:
>
> - Reveal the content of any assessment item developed for use on PIAAC.
>
> - Reveal the content of any secure material, including items and scoring guides, from PIAAC.
>
> - Make any improper disclosure whereby a survey respondent or his/her related data could be identified, which includes but is not limited to information collected for PIAAC.
>
> - Permit anyone other than the individuals authorised by the PIAAC Consortium to access PIAAC items, cognitive laboratory materials, data or reports.
>
> - Use or reveal any individually identifying information furnished, acquired, retrieved or assembled by him/herself or others, for any purpose other than statistical or reporting purposes specified by the PIAAC Consortium.
>
> **Guideline 13.5.1B** Data capture, coding and scoring should be carried out on the premises of the survey organisation in order to minimise the number of, or even rule out the possibility of, paper materials outside of the organisation's reach and control.

Quality Control Procedures

328.   As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to provide the details of their proposed data capture, coding and scoring security plan to the PIAAC Consortium.

329.   During the survey planning and data collection period, countries will be required to report, as part of the National Monitoring Report, the details of their security plans.

13.6. DATA FILE CREATION

Purpose

330.　　To ensure that the national databases—including those delivered to 1) the PIAAC Consortium for internal analysis and validation after the field test, 2) the PIAAC Consortium for analysis and macro-level reporting after the main study, and 3) public users as a microdata file—comply with the country's confidentiality rules and regulations.

Rationale

331.　　In PIAAC, micro-level data will be collected from households. Respondents must be assured that the information they provide will be used in such a way that their confidentiality is protected. On the other hand, confidentiality measures will affect the utility of the data to researchers.

332.　　Each participating country is expected to have its own rules for preventing the disclosure of information likely to enable the identification of a person or household. Legislative requirements for data modifications (binning, censoring, masking, suppression, etc.) are expected to vary by country and will further depend on the type of information collected in PIAAC and, for example, the observed cell sizes when cells containing potentially confidential information are cross-tabulated.

Standards, Guidelines and Recommendations

Standard 13.6.1 Consistent with Standard 13.1.1 for sample design and weighting files, each country must provide the PIAAC Consortium with early notification of any rules affecting the disclosure and sharing of PIAAC data in the background questionnaire (BQ)/job requirements approach (JRA) module and its derived variables and codes for the International Standard Classification of Education, International Standard Classification of Occupations and International Standard Industrial Classification of All Economic Activities.

> **Guideline 13.6.1A** Countries should carefully review the information collected through the BQ/JRA and provide as much detail as possible, as is known at that time, about the intended or typically used methods for disclosure avoidance and routinely considered variables and demographics.

> **Guideline 13.6.1B** Countries should explain whether their legislative regulations and rules will affect 1) the microdata files used by the PIAAC Consortium to validate instrumentation, model assessment scales and report on an aggregated level after the field test and main study or 2) only the microdata file to be released for public use.

Standard 13.6.2 Based on the documented and agreed-upon confidentiality regulations, each country is responsible for either 1) implementing any necessary confidentiality measures in its microdata file before delivery to the PIAAC Consortium or 2) instructing the PIAAC Consortium on how to implement the methods and modifications in the country database before public release.

Quality Control Procedures

333.　　As part of the National Survey Design and Planning Report process for the field test and the main study, countries will be required to report any confidentiality rules that will limit data sharing. The PIAAC Consortium will review the plans and contact the country representative for further discussion.

ANNEX 13-1. SAMPLE CONFIDENTIALITY FORM

PIAAC Confidentiality Agreement

•──•

(Translators/Reviewers of OECD/PIAAC Assessment Instruments) [13]

Name: _____

Phone number: _____

e-mail: _____

Address: _____

_____

This is to certify that I, _____ have agreed to provide linguistic services [14] (translation/review of assessment instruments) within the framework of the:

OECD PROGRAMME FOR THE INTERNATIONAL ASSESSMENTS OF ADULT COMPETENCIES (PIAAC)

I understand that the signing of this form is an acknowledgment of my professional responsibility to maintain complete integrity of security for this project. I declare that I will not divulge any project information, trial materials, test materials, processes, contents or results, or any other materials, documents or information pertaining to the project, or its clients or suppliers, to any person or organisation as directed under the terms of the project.

I understand that the above does not apply to information that is in the public domain.

I have read and accept the conditions as outlined above.

Signature ….…………………………………………. Date ….……………..

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[13] Adapt for other project staff as appropriate

[14] Adapt job description as needed

14. WEIGHTING STANDARDS

Purpose

334.   To provide a standard weighting approach and to facilitate the production of point estimates for the target population and their associated sampling error estimates.

Rationale

335.   Sampling weights account for differential sampling rates, differential response rates, and undercoverage and are calibrated to population control totals. They ensure that the estimates represent each country's target population and reduce the potential for bias due to nonresponse. Replicate weights are created to capture the variation due to the sample design and selection, as well as weighting adjustments. Replicate weights also account for measurement error through the processing of plausible values. The replication design must conform and adapt to the PIAAC Data Explorer, which will be used to estimate sampling errors and to analyze the data. Using the same weighting approaches will result in comparable estimates and sampling error estimates across countries.

Standards, Guidelines and Recommendations

Standard 14.1 The PIAAC Consortium is responsible for deriving sampling weights for the main study for all participating countries. However, countries may opt to compute their own sampling weights.

Standard 14.2 If weighting is performed by the PIAAC Consortium, the country is responsible for providing a file with all variables necessary for the weighting process.

   Guideline 14.2A See Standard 3.6.7 and Annex 3-1 for the Sample Design International File Layout.

   Guideline 14.2B The file should contain the final data, after all edits have been performed and confidentiality measures have been taken.

Standard 14.3 The creation of full sample weights will involve four main stages:

- base weights, reflecting the probability of selection;
- nonresponse-adjusted weights, intended to reduce nonresponse bias in estimates by adjusting for nonresponse;
- trimmed weights, produced by minimal trimming of extreme weights;
- benchmarked weights, created by adjusting survey estimates to known population totals.

   Guideline 14.3A A final weight is required for all sampled persons with a completed background questionnaire (BQ)/job requirements approach (JRA) module. A completed BQ/JRA is one that contains at least the key background questions (age, gender, highest level of schooling and employment status).

   Guideline 14.3B If the survey involves a screener stage, then the weighting process will include the creation of both household-level and person-level weights. The household-level weights will reflect the household selection probability and will be adjusted for nonresponse to the screener. The person-level base weights will then be derived from the final household weights and the within-household

probability of selection. The final weights will be created by adjusting the person-level base weights for person-level nonresponse and benchmarking them to population totals.

Guideline 14.3C An additional weighting adjustment will be needed for cases with unknown eligibility (*i.e.* whether they contain a person 16 to 65 years old), such as households with maximum call backs. This step will involve distributing the weights of cases with unknown eligibility to those with known eligibility.

Guideline 14.3D Trimming can be used to reduce the influence of large weights. Trimming extreme weights can introduce bias but has the benefit of reducing variance. Because of the potential for bias, countries that do their own weighting must consult with the PIAAC Consortium before trimming.

Recommendation 14.3A If the country chooses to perform its own weighting adjustments, the WesVar® software can be a helpful tool and can be downloaded for free from http://www.westat.com/wesvar/.

Recommendation 14.3B For more information on weighting, refer to Appendix A of the WesVar® User's Guide (http://www.westat.com/wesvar) or the Cross-Cultural Survey Guidelines website (http://ccsg.isr.umich.edu/index.cfm).

Standard 14.4 Persons who do not complete the survey for a literacy-related reason (*e.g.* language barrier) cannot be represented by survey respondents.

Guideline 14.4A The literacy-related nonrespondents cannot be represented by survey respondents, because their reason for not completing the survey is directly related to the survey outcome. Therefore, the literacy-related nonrespondents should be excluded from the adjustment for non-literacy-related nonresponse. Literacy-related nonrespondents at the screener stage can be represented by those at later stages.

Guideline 14.4B The literacy-related nonrespondents should be included in the benchmarking adjustment with the survey respondents, because they are considered part of the PIAAC target population.

Standard 14.5 Countries need to choose variables for the nonresponse adjustment that are of high quality, are available for all eligible units, and are related to literacy and response propensity.

Guideline 14.5 Before selecting variables for the nonresponse adjustment, countries must run an analysis of the relationship between the potential adjustment variables and response propensity. See Chapter 16 on nonresponse bias analysis standards for more information.

Recommendation 14.5 Past adult literacy surveys can be used to evaluate the relationship of available variables to literacy.

Standard 14.6 At a minimum, weights must be benchmarked to control totals for age and gender. All variables selected for benchmarking must have reliable control totals available and all countries must deliver the control totals according to the weighting file layout in Annex 14-1.

Guideline 14.6A The quality of data from external sources must exceed the quality of data from PIAAC (*e.g.* the standard errors of the external estimates must be smaller than those of the non-benchmarked estimates from the survey).

Guideline 14.6B The concepts, definitions and coverage of the data (counts) from external sources must be the same as those used by PIAAC. If not, the counts from the external sources must be adjusted to make these comparable to the survey estimates.

Guideline 14.6C A control total file is required for each variable (*i.e.* dimension, combination of variables) used in the benchmarking adjustment.

Guideline 14.6D Each control total file must have a variable that matches to a corresponding variable on the case-level Sample Design International File Layout with the exact same number of categories.

Standard 14.7 If a country chooses to perform its own weighting adjustments, the weights must be delivered according to the weighting file layouts provided in Annexes 14-2 and 14-3.

Guideline 14.7A The file containing the weights at each stage (see Annex 14-2) will be used to perform quality control checks on the weighting process.

Guideline 14.7B The file containing the final weights (see Annex 14-3) will be used for data processing and estimation.

Standard 14.8 Jackknife replicate weights will be created to facilitate the computation of sampling error estimates.

Guideline 14.8A Countries not conducting weighting must provide the data necessary for creating replicate weights, as specified in the Sample Design International File Layout.

Guideline 14.8B Countries conducting weighting and forming jackknife replicate weights must provide the data necessary for creating replicate weights, so that sufficient checks can be produced.

Guideline 14.8C Countries conducting weighting and forming jackknife replicate weights must deliver the replicate weights to the PIAAC Consortium while adhering to the Weighting International File Layout.

Guideline 14.8D Countries conducting weighting and forming jackknife replicate weights must provide detailed specifications for the formation of their replicate weights as part of the National Survey Design and Planning Report process.

Recommendation 14.8 If sample design ID variables (PSU ID, SSU ID) are protected by the country's confidentiality rules, then the variance stratum (VARSTRAT) and variance unit (VARUNIT) must be supplied, as specified in the Sample Design International File Layout.

Standard 14.9 A minimum of 15 and a maximum of 35 jackknife replicate weights will be allowed.

Guideline 14.9A Although the minimum number of replicates is 15, more are needed if the country desires more accurate variance estimates with more degrees of freedom.

Guideline 14.9B A maximum of 35 replicates is specified to balance the need to allow a sizable number of primary sampling units with the need to manage the cost for increased data storage and data processing.

Standard 14.10 Replicates will be formed from the full sample to facilitate sampling error estimation through the PIAAC Data Explorer.

Recommendation 14.10 Replication is adaptable to a wide variety of designs, including simple random sampling, systematic sampling, stratified designs and multi-stage cluster designs. Details on forming replicate weights will be provided to countries that are forming their own replicate weights. Another resource for guidance on how to form replicates is the WesVar® User's Guide (http://www.westat.com/wesvar/) for guidance on how to form replicates for JK1 or JK2 approaches.

Standard 14.11 All weight adjustments that are conducted for the full sample must be conducted on each replicate weight to capture the variation created, or reduced, by the weight adjustments.

Recommendation 14.11 Once replicates have been created, WesVar® can be used to conduct the nonresponse adjustments and raking adjustment on the full sample, which will adjust the replicate weights at the same time.

Quality Control Procedures

336.   As part of the National Survey Design and Planning Report process for the field test and main study, countries will be required to specify whether or not they will perform their own weighting and, if so, to provide details of their weighting and variance estimation plans. If countries prefer to form their own weights, the plan will be reviewed for adherence to the above standards before approval.

337.   During the weighting period, countries that perform their own weighting will be required to report on their weighting process as part of the National Monitoring Report. Quality checks will be developed to review the weighting process and evaluate the potential for nonresponse-related bias in descriptive variables (such as region of the country and percentage of minority population in geographic areas). The quality checks will be performed after each step in the weighting process. The checks will include:

- Reviewing the distribution of weights at each stage to identify any missing or extreme values.

- Computing the weighted frequencies of important survey characteristics after each weighting adjustment to show how each adjustment affects the estimates for key survey variables. In addition, weighted frequencies will be compared to reliable external totals.

- Reviewing a random listing of records for abnormalities.

- Producing the mean, median, minimum and maximum and checking for each replicate weight after each weight adjustment.

- After the final weights are produced, producing preliminary standard errors and design effects on survey variables as a check on the replicate weights.

ANNEX 14-1. WEIGHTING INTERNATIONAL FILE LAYOUT
FOR BENCHMARK CONTROL TOTALS

A file is required for each dimension used in the benchmarking process (*i.e.* raking). For example, if control totals exist by age categories and by education attainment categories, then two files must be delivered. If control totals exist for education categories within each age category, then one file is needed. Each file will have two variables and only $x+1$ records where there exists x categories. For example, for a variable RAKE_DIM1 with four categories, the control total file would appear as follows:

RAKE_DIM1	TOTAL
1	132 940
2	128 973
3	165 267
4	143 744

A further requirement is that the sum of the totals for each file must sum to the same total.

These files are flat ASCII files. The following is a sample layout for the first control total file.

Variable Name	Label	Comments
RAKE_DIM1	Raking dimension 1	Required. This variable name and number of categories matches a corresponding variable on the Sample Design International File Layout
TOTAL	Control total for RAKE_DIM1	The sum across categories of RAKE_DIM1 must equal the sum across categories of RAKE_DIM2 in the second control total file, and so on.

**ANNEX 14-2. WEIGHTING INTERNATIONAL FILE LAYOUT
FOR QUALITY CONTROL CHECKS**

338.   These files must include all sample persons. In addition, they must include any prior stage without sampled persons, *e.g.* all sampled households for which a sampled person was not identified during the household screener.

339.   These files are flat ASCII files.

Variable Name	Label	Comments
ID_PERS	Person identification number	Required. This ID matches the person ID on the sample design file.
ID_HH	Household identification number	Required if households are selected. This ID matches the household ID on the sample design file. It repeats for each person selected within the household and is blank for one-stage designs.
HHBWT	Screener base weight	Required if households are selected.
HHNRWT	Screener nonresponse-adjusted weight	Required if households are selected. This will be zero for households that were nonrespondents to the screener. It should include the adjustment for unknown eligibility, if applicable.
SPBWT	Sample person base weight	Required. This will be missing for households with no sampled persons.

SPNRWT	Sample person nonresponse-adjusted weight	Required. This will be zero for nonrespondents to the BQ/JRA and missing for households with no sampled persons.
SPTWT	Sample person trimmed weight	Required if any trimming was performed. This should have a positive, non-missing value for all respondents to the BQ/JRA.
SPFWT	Final calibrated sample person weight	Required. This should have a positive, non-missing value for all respondents to the BQ/JRA.
SPFWTR1 - SPFWTRxx	Final replicate weight 1 through final replicate weight *xx*, where *xx* = the number of replicates	Required. This should have a non-missing value for all respondents to the BQ/JRA.

BQ, background questionnaire; JRA, job requirements approach module.

**ANNEX 14-3. WEIGHTING INTERNATIONAL FILE LAYOUT
FOR DATA PROCESSING AND ESTIMATION**

Variable Name	Label	Comments
ID_PERS	Person identification number	Required. This ID matches the person ID on the sample design file.
SPFWT	Final calibrated sample person weight	Required. This should have a positive, non-missing value for all respondents to the BQ/JRA.
SPFWTR1 - SPFWTRxx	Final replicate weight 1 through final replicate weight *xx*, where *xx* = the number of replicates	Required. This should have a non-missing value for all respondents to the BQ/JRA.
		Required. This should have a non-missing value for all respondents to the BQ/JRA.

BQ, background questionnaire; JRA, job requirements approach module.

15. ESTIMATION STANDARDS

Purpose

340.   To ensure that point estimates and associated sampling error estimates reflect the sample design and selection, and to provide a standard approach for ensuring comparability across countries.

Rationale

341.   The use of sampling weights allows for estimation of the target population parameters. Replicate weights capture the variation due to the sample design and selection, as well as weighting adjustments. Using the same estimation approach reduces error due to differential weighting and variance estimation procedures when making comparisons between countries.

Standards, Guidelines and Recommendations

Standard 15.1 Estimates produced using PIAAC data will be weighted population estimates that use the final sample weights.

Standard 15.2 The sampling error measures for PIAAC population estimates – such as variances, standard errors and coefficients of variation – will be computed using the jackknife method.

Quality Control Procedures

342.   Checks on the weights and jackknife replicate weights are provided in Chapter 14.

16. NONRESPONSE BIAS ANALYSIS STANDARDS

Purpose

343.   To evaluate the potential for nonresponse bias when data are missing in national samples because:

- Some of the adults selected in the sample were not contacted or refuse to participate (referred to as unit nonresponse) or failed to respond to a particular survey item (referred to as item nonresponse);

- Data collected from the sampled adults are contaminated (and thus not useful) or were lost during or after the data collection phase.

Rationale

344.   Under ideal situations, every eligible adult in the target population would have a non-zero chance of selection in a national sample, would be located and would agree to participate in the study. In practice, these circumstances are not realised in any survey population. Nonresponse bias can be substantial when two conditions hold: 1) the response rate is relatively low and 2) the difference between the characteristics of respondents and those of nonrespondents is relatively large.

Standards, Guidelines and Recommendations

Standard 16.1 Countries with any unit nonresponse will be required to conduct a basic nonresponse bias analysis to evaluate the potential for bias and to select variables for nonresponse weighting adjustments.

> **Guideline 16.1** The analysis will involve an evaluation of the relationship between response status and available auxiliary variables. (See Standard 14.5 for the requirements on nonresponse adjustment variables.)

> **Recommendation 16.1A** A logistic regression analysis or classification tree algorithm is recommended for this evaluation of potential bias, to incorporate interactions between the auxiliary variables as well as main effects.

> **Recommendation 16.1B** The evaluation can be performed using base weights (*i.e.* weighting each unit by the inverse of its selection probability) to reflect differential sampling weights.

Standard 16.2 Countries will be required to conduct a more extensive nonresponse bias analysis for:

- All stages of data collection (screener, background questionnaire/job requirements approach module and assessment) with less than an 80% response rate.

- The overall sample if the overall response rate is less than 70%.

Recommendation 16.2A Some possible analyses include:

- A comparison of estimates to external totals

- A comparison of response rates by demographic subgroup

- A comparison of respondents and nonrespondents on auxiliary variables

- A logistic regression model of the relationship between response status and auxiliary variables

- A comparison of estimates before and after weighting adjustments

- Correlations between weighting adjustment variables and literacy measures

- A comparison of "late" or "hard-to-contact" respondents to "early" or "easy-to-contact" respondents

- Calculation of the range of potential bias. (Refer to the PIAAC sampling plan for a description of this estimate.)

Recommendation 16.2B The analysis should include some auxiliary variables not used in the weighting adjustments.

Recommendation 16.2C Refer to Van de Kerckhove, Krenzke, and Mohadjer (2006) for examples of unit nonresponse bias analyses.

Standard 16.3 If the overall response rate falls below 50%, the results of the nonresponse bias analysis will be reviewed by the PIAAC Consortium to determine whether or not the country's results will be published. (See Guideline 3.7.1B.)

Standard 16.4 Countries will be required to conduct an item nonresponse bias analysis for any background questionnaire items with response rates below 85%.

Recommendation 16.4 Respondents and nonrespondents to the item can be compared on other background questionnaire items that were completed by all or almost all (99.9% or more) respondents to the survey.

Quality Control Procedures

345. As part of the National Survey Design and Planning Report process for the main study, countries will be required to outline a strategy for assessing nonresponse bias.

346. Countries are required to conduct the nonresponse bias analysis, and the results will be reviewed by the PIAAC Consortium and reported to the country and the PIAAC Consortium.

REFERENCES

Van de Kerckhove, W., T. Krenzke, and L. Mohadjer (2006), "Approaches to a Nonresponse Bias Analysis in an Adult Literacy Survey," *Proceedings of the Survey Research Methods Section, American Statistical Association*, pp. 3790-3795.

17. DOCUMENTATION STANDARDS

Purpose

347.   To document PIAAC practices in each participating country to inform data users, create a reference for future surveys and provide an evaluative summary of all aspects of PIAAC survey practices.

Rationale

348.   Data users need to be informed of the PIAAC concepts, definitions and survey design in order to conduct a meaningful analysis of the data. Furthermore, thorough documentation of PIAAC can aid future designers of similar surveys.

Standards, Guidelines and Recommendations

Standard 17.1 Each country will prepare a final survey report after the completion of data collection.

> **Guideline 17.1A** The final survey report should thoroughly document the actual survey experiences in each country. The report should identify the aspects of the survey that worked well and also include an explanation of problems encountered.

> **Guideline 17.1B** The report will be based on an outline provided by the PIAAC Consortium and will include the following topics:

- Major Analytic Objectives of PIAAC.

- Country-Specific Objectives.

- Special Population Subgroups.

- Sample Design and Selection:

  - Target Population
  - Sampling Frame
  - Sample Size
  - Sample Design
  - Sample Selection
  - Response Rates
  - Respondent Incentives
  - Sample Monitoring

- Survey Instruments:

- o Country-Specific Supplemental Background Questionnaire Items
- o Selected National Option for the Assessment
- o Translation
- Information Technology

- Field Management:

  - o Organisation of Data Collection Staff
  - o Supervision and Monitoring
  - o Recruitment and Hiring of Data Collection Staff

- Data Collector Training:

  - o Supervisor Training
  - o Interviewer Training

- Data Collection:

  - o Contact Procedures
  - o Promoting Respondent Participation and Obtaining Specified Response Rates
  - o Study Management System
  - o Quality Control of Fieldwork

- Data Processing

- Confidentiality and Data Security

- Estimation:

  - o Weighting
  - o Variance Estimation

- Nonresponse Bias Analysis

- Quality Assurance Procedures

- Findings

Standard 17.2 PIAAC documentation must include copies of the background questionnaire in each language tested in each country, all operations manuals (interviewer manual, supervisor manual, etc.), the final record layout and the editing specifications.

Guideline 17.2 An electronic version of these items should be kept for future reference.

Quality Control Procedures

349.   Countries must report their progress in developing the report to the PIAAC Consortium.