



International
Labour
Organization

Guidelines

Actuarial Work for Social Security

Edition 2016



Copyright © International Labour Organization and International Social Security Association 2016
First published 2016

Short excerpts from this work may be reproduced without formal authorization, on condition that the source is indicated. It is also important that individual guidelines should be seen as one element of the section of the full document to which they belong. They should therefore be considered in conjunction with other individual guidelines from that section (and more generally the full document) to ensure that the context of the individual guideline is fully appreciated.

For rights of reproduction or translation of the work in its entirety, application should be made to ILO Publications (Rights and Licensing), International Labour Office, CH-1211 Geneva 22, Switzerland, or by email: rights@ilo.org. The International Labour Office and International Social Security Association welcome such applications.

ILO; ISSA

Guidelines on actuarial work for social security / International Labour Office; International Social Security Association. Geneva: ILO, 2016

Social security administration, actuarial, management development, good practices.

ILO ISBN: 9789221312284 (print); 9789221312291 (web pdf)

ISSA ISBN: 9789284312276 (web pdf)

Also available in French, German and Spanish. Forthcoming in Arabic, Chinese and Russian.

02.14.01

ILO Cataloguing in Publication Data

The designations employed in ILO and ISSA publications and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the ILO or ISSA concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.

The responsibility for opinions expressed in signed articles, studies and other contributions rests solely with their authors, and publication does not constitute an endorsement by the ILO or ISSA of the opinions expressed in them.

Reference to names of firms and commercial products and processes does not imply their endorsement by the ILO or ISSA, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

ILO publications and digital products can be obtained through major booksellers and digital distribution platforms, or ordered directly from ilo@turpin-distribution.com. For more information, visit our website: www.ilo.org/publns or contact ilopubs@ilo.org.

English is granted precedence as the authoritative language for all ISSA Guidelines.

The ISSA Guidelines and related resources are available at www.issa.int/excellence.

Printed in Switzerland

Contents

Introduction	1
Scope and Objectives	1
Structure of the <i>ISSA-ILO Actuarial Guidelines</i>	4
Supporting Material	4
A. Valuation of Social Security Schemes	5
Guideline 1. The need for carrying out actuarial valuations	6
Guideline 2. Data	7
Guideline 3. Assumptions	10
Guideline 4. Valuation methodology	13
Guideline 5. Projection model	15
Guideline 6. Determining the value of the social security scheme's assets	17
Guideline 7. Reconciliation	18
Guideline 8. Uncertainty of results	19
Guideline 9. Reporting	21
Guideline 10. Operational control	22
Guideline 11. Independent expert review	23
Guideline 12. Following the recommendations of the operational audit and independent expert review	25
B. Operational Management of Social Security Systems	26
Guideline 13. Determination of benefit entitlements	27
Guideline 14. Determination of actuarial factors	29
Guideline 15. Determination of rate of return to be credited to provident fund accounts and the resulting financial implications	31
Guideline 16. Determination of rate of return to be credited to notional accounts and resulting financial implications	33
Guideline 17. Supervision of individual funded accounts	34
Guideline 18. Determination of rate of conversion of lump sums to income	36
Guideline 19. Automatic adjustment mechanisms	38
C. Investment Issues	39
Guideline 20. Investment governance	40
Guideline 21. Taking into account liabilities in the investment process	42
Guideline 22. Investment management processes	44

Guideline 23. Input into the valuation of assets and benefit calculations	46
Guideline 24. Investment reporting	48
D. Reporting, Communication and Disclosure	49
Guideline 25. Communication between board members, management and the actuary	50
Guideline 26. Reporting process considerations	51
Guideline 27. The social security institution’s responsibilities with respect to actuarial reporting and communication of changes in scheme’s provisions	53
Guideline 28. Technical and non-technical communication of actuarial information	54
E. Risk Management and Analysis	56
Guideline 29. Risk management framework	57
Guideline 30. Identification of risk	60
Guideline 31. Measurement of risk	61
Guideline 32. Mitigation of risk	63
Guideline 33. Actuarial input into the management of scheme risks	65
Guideline 34. Actuarial input into the management of operational risks faced by the social security institution	68
F. Regulatory Issues, Standards and Professional Guidance	70
Guideline 35. Compliance with regulatory requirements	71
Guideline 36. Compliance with actuarial standards	73
Guideline 37. Compliance with accounting standards	75
Guideline 38. Compliance with requirements of national and international statistical reporting	77
Guideline 39. Other professional standards and guidance	79
G. Policy and Strategy Issues	81
Guideline 40. Designing a new social security scheme	82
Guideline 41. Valuation and costing of a new social security system	84
Guideline 42. Funding and financing considerations	87
Guideline 43. Sustainability considerations	89
Guideline 44. Benefit adequacy	91
Guideline 45. Coverage	93
Guideline 46. Implications of changes and reforms in benefits and financing	96

H. Actuarial Expertise, Staffing and Training within the Social Security Institution	98
Guideline 47. Independence of the actuary	99
Guideline 48. The choice between the use of external or internal actuarial expertise	101
Guideline 49. Qualifications	103
Guideline 50. Staffing and infrastructure	105
Guideline 51. Developing and maintaining professional expertise	106
Acknowledgements	107

Introduction

These *Guidelines on Actuarial Work for Social Security* (hereafter referred to as *ISSA-ILO Actuarial Guidelines*) have been produced jointly by the International Social Security Association and the International Labour Organization.

Scope and Objectives

These guidelines are written for actuaries and other social security professionals undertaking actuarial work for social security schemes, as well as social security institutions, policy-makers and other stakeholders overseeing or reviewing actuarial work.

The objectives of the guidelines are to provide guidance to these different stakeholders in their work as it relates to the planning, management, financing and provision of social security benefits. The guidelines are structured to provide a list of issues to consider and recommendations in the carrying out of these duties. These duties will vary according to the stakeholder concerned and may include performing actuarial calculations, providing or formulating policy advice, supervision, reporting, management and communication.

The main objectives are therefore to:

- Promote good practice in relation to actuarial work undertaken by, and for, social security institutions and to support efforts to improve accuracy, consistency and comparability of actuarial work;
- Provide guidance for the procedures carried out by actuaries in their work;
- Facilitate the work of institutions in their governance procedures relating to actuarial work;
- Improve the efficiency of actuarial procedures;
- Provide practical assistance to institutions to facilitate their compliance with actuarial standards;
- Provide guidance to individuals or bodies responsible for policy issues and regulation on actuarial involvement.

The ISSA-ILO Actuarial Guidelines, and Existing and Future Professional Standards

This document provides a series of recommendations regarding the principles, structures and processes that should be put in place and undertaken to meet the objectives referred to above. It therefore seeks to assist actuaries in their efforts to meet international and national standards as well as regulatory requirements. However, the *ISSA-ILO Actuarial Guidelines* are not legally binding; they should be considered as identifying and detailing good practice in respect of the wider objective of improving the carrying out and monitoring of actuarial work.

It should also be noted that it is not the goal of the guidelines to duplicate or replace the International Standards of Actuarial Practice (ISAP) of the International Actuarial Association (IAA), in particular No. 2 (ISAP 2) on social security, or any relevant national actuarial standards. Rather it is to assure that social security institutions provide actuaries and other social security professionals performing actuarial work with the tools necessary for compliance with ISAP 2 as well as other good practices in relation to social security actuarial work.

Definitions of "Actuarial Work" and "Actuary"

The *ISSA-ILO Actuarial Guidelines* seek to provide support for **actuarial work** carried out in the areas considered as traditional actuarial domains as well as in other areas where actuarial involvement is either widespread or recommended.

In this context, **actuarial work** for the purpose of these guidelines therefore includes:

- Actuarial activities such as preparing actuarial valuations of social security systems; work related to national accounts and national and/or international accounting reporting; assessing sustainability impacts of proposed changes; and performing actuarial calculations necessary for determination of benefit entitlements and funding measures. These tasks may include calculations of liabilities, projection of cash flows and determination of various actuarial factors and legislation or other regulations that often require these tasks to be carried out by qualified actuaries;
- Actuarial input in areas such as investment management, policy development, risk management, communication, governance, considering impact on individuals and evaluation of fairness and equity between cohorts and other groups where actuarial skills and competencies can add value to the social security institution or governing body.

Unless specified otherwise, an **actuary** for the purpose of these guidelines means:

- An actuary employed directly by a social security institution as well as a consulting actuary who provides reports, advice or other input to institutions on a contractual basis and who has a recognized actuarial qualification at the national or international level (reference should be made to Guideline 49); or
- A professional without a recognized actuarial qualification (e.g. statisticians and economists) who carries out actuarial work. These guidelines recognize that in some situations, various professionals other than actuaries may be involved in performing actuarial work. However, it is important that social security professionals without actuarial affiliation involved in providing actuarial services to social security institutions possess relevant qualifications and follow relevant rules of professional conduct as described in Guideline 49.

Promotion of Actuarial Qualifications, Recognition and Professional Development

While these guidelines seek to provide support to both actuaries and non-actuaries involved in actuarial work, it is important for social security institutions to **promote development of the national actuarial profession and to acknowledge the value of a recognized actuarial qualification and continuing professional development** (see Guideline 51). Furthermore, even if each country may set their own requirements regarding qualifications, experience and competencies for professionals carrying out the actuarial work referred to in this document (and whether they are considered a "fit and proper" person to carry out the tasks assigned), these guidelines encourage those supervising actuarial work to set qualification requirements recognizing the importance of the actuarial profession. The regulators and supervising authorities should consider qualifications specific to the social security scheme when defining competencies required for carrying out actuarial work. The guidelines also encourage those carrying out actuarial work to comply with qualification requirements, undertake continuing professional development and adopt behaviours consistent with the minimum code of conduct of the IAA or that of the actuarial association of which the actuary is a member.

Part H and the associated supporting material provide more details.

Areas of Actuarial Involvement

Legislation, regulation and/or internal rules and governance procedures are likely to influence the areas of actuarial involvement and the competence, qualifications and professionalism required to carry out the work.

These guidelines cover the four situations where actuaries may be involved and/or where actuarial work is undertaken in respect of social security:

- Work which must (according to regulation or other legal instruments) be carried out by a recognized and qualified actuary;
- Work where the involvement of actuaries is important and actuaries are likely to play the principal role;
- Work where actuarial involvement and input is desirable;
- Work which requires actuarial techniques to be applied but in reality may be carried out by non-actuaries.

The social security institution should determine for their own situation which elements of work fall under which of the four categories above. This should be properly documented and regularly reviewed. The decision will depend on a number of different factors both internal to the institution and external. These may include (but not be limited to):

- The regulatory and supervisory framework concerning the work in question;
- The materiality of the work undertaken, i.e. the impact it may have on the financial situation of the institution and/or the social security scheme;
- The actuarial resources and peer review processes existing within the institution;
- The development and resources of the national actuarial professional body;
- External (to the institution) actuarial resources available;
- Other professional resources available.

Coordination with Other Professionals and Stakeholders

As actuaries are becoming involved more widely in different aspects of social security institution management, there is increasing need for greater coordination and consultation with other professionals and stakeholders. These guidelines set out, for the different areas of involvement, where such coordination should be undertaken and, where necessary, formalized. Where the actuary is external to the organization, it is especially important that appropriate procedures should be put in place and followed to ensure that efficient and effective coordination is carried out.

Independence of Function

The social security institution and supervising authorities should seek to ensure and maintain the independence of the actuary. In practice, this means ensuring that the actuary has sufficient access to data, has choice over the most appropriate methodology and set of assumptions to use, and is not unduly influenced by external considerations or subject to internal pressure that may have an impact on results and recommendations. Supporting regulations and legislation should exist to secure this independence

of function, as well as procedures to undertake where the independence is, or may be, compromised. More information is provided in Guideline 47.

Structure of the *ISSA-ILO Actuarial Guidelines*

The guidelines are comprised of eight separate parts:

Part A, Valuation of Social Security Schemes

Part B, Operational Management of Social Security Systems (including benefit calculations and determination of factors)

Part C, Investment Issues

Part D, Reporting, Communication and Disclosure

Part E, Risk Management and Analysis

Part F, Regulatory Issues, Standards and Professional Guidance

Part G, Policy and Strategy Issues

Part H, Actuarial Expertise, Staffing and Training within the Social Security Institution

Within each part, individual guidelines cover the different elements of the subject area. Each individual guideline is structured as follows:

Guideline. The guideline is stated as clearly as possible with a brief description of the key points underlying it set out in bold.

Principles. This part sets out the principles underlying the guideline and appropriate structures to put in place to address the issue.

Mechanism. This part sets out the steps and processes to be taken to ensure that the principles underlying the guideline are respected. The suggested mechanisms are designed to ensure appropriate controls, processes, communication and incentives which encourage good decision-making, proper and timely execution, and regular review and assessment.

Supporting Material

These *ISSA-ILO Actuarial Guidelines* include the principles that social security institutions should consider in relation to actuarial work undertaken for social security schemes. They are not intended either as a detailed actuarial manual or as standards of practice. Their goal is to guide social security institutions in the “what” to consider but not the question of “how”.

Therefore, as part of the support to social security institutions, the ISSA and the ILO have developed supporting material, including manuals (such as the ILO document *Internal guidelines for actuarial analysis of a national social security pension scheme*), examples of good practice, external references and case studies that will assist social security institutions in translating these principles into practice.

These supporting materials can be accessed in a separate document and via links on the website dedicated to the guidelines.

A. Valuation of Social Security Schemes

Valuations of a social security scheme are aimed at assessing their actuarial soundness. Soundness may be defined in a variety of ways and social security institutions should define measures of soundness appropriate to their situation and their scheme. As stated in the *ISSA Guidelines on Good Governance* (Guideline 59), a social security scheme should carry out regular actuarial valuations to monitor sustainability and other key elements.

Guidelines in this part address the main elements of the actuarial valuation, the responsibilities of an actuary, and actions that a social security institution should undertake in order to ensure that actuaries can fulfil their professional duties.

The approach undertaken will depend on whether the actuarial valuation model has been developed internally by the social security institution or whether a valuation is performed using a model developed externally. In this latter case, the approach will again vary according to whether the institution carries out the valuation itself or whether the external actuarial resource does so. Whereas this part focuses mainly on the first two cases, appropriate processes are also required when the valuation is undertaken externally and external advisers should be able to demonstrate compliance with the guidelines and with relevant actuarial standards of practice.

Guideline 1. The need for carrying out actuarial valuations

The social security institution ensures that regular actuarial valuations are conducted to assess and monitor the financial situation of social security programmes. The social security institution further ensures that an actuarial valuation is conducted at the inception of a new programme, or whenever an existing programme is materially changed.

Actuarial valuations are primarily required to assess the sustainability of social security programmes but may also be required to assess system adequacy, financing and funding considerations. Findings of actuarial valuations also have an impact on investment decisions, benefit calculations and communication or disclosure. This guideline should be read together with Guidelines 26, 41, 43 and 46 and Guideline 59 of the *ISSA Guidelines on Good Governance*.

Principles

- The social security institution should promote and support relevant legislation requiring regular actuarial valuations of existing programmes and the carrying out of actuarial valuations whenever a programme is materially changed.
- The social security institution should ensure that resources are made available to ensure that regular valuations are carried out. The management of resources should also take into account situations where supplementary or updated valuations are required.
- When participating in the development of new social security programmes, the social security institution should ensure that an actuarial valuation is performed to assess the appropriateness of the benefit and financing design. Guideline 41 provides more information regarding the valuation of new social security programmes.

Mechanism

- The social security institution should support the relevant authorities in defining the situation when an actuarial valuation is required (regular, supplementary and/or updated valuations) and the factors impacting this choice (e.g. materiality levels). The social security institution should provide necessary information and advice regarding the scope and objectives of a valuation as well as minimum disclosure requirements. Guideline 46 provides assistance in determining which situations may require a supplementary or updated actuarial valuation.
- The social security institution should advise the relevant authorities on the optimal frequency of actuarial valuations. This issue is covered further in Guidelines 26 and 43.
- In the absence of legislative requirements, the social security institution should establish and follow an internal policy on the need for an actuarial valuation. This policy should be documented, reviewed regularly (if necessary, by an external independent expert) and acted upon.

Guideline 2. Data

The social security institution ensures the availability of sufficient and reliable data necessary to perform actuarial work. The social security institution is responsible for the management of the data pertaining to the social security scheme participants and provisions, and compliance with data privacy legislation and national standards. The actuary provides an opinion on sufficiency and reliability of data, describes any modification made to data and the impacts of imperfect data on the social security scheme and its participants, and makes recommendations for improving the quality of data.

Sufficient and reliable data are an essential element necessary for performing any type of actuarial work. Data requirements depend on the type of work undertaken, the benefit structure of the social security scheme (including benefit design and financing structure), the nature and objective of the actuarial analysis, reporting requirements, and any regulatory or legal requirements concerning the analysis or reporting.

Actuarial work assessing the financial sustainability of a social security scheme requires up-to-date data specific to the assessed scheme as well as general demographic and macroeconomic data necessary to set the demographic and macroeconomic framework for the actuarial work. The data that enables valuations to be performed include current beneficiary and contributor data and information on current and past system rules, as well as any planned or contemplated future changes in these rules (e.g. benefit formula, basic benefit package, eligibility for benefits and contribution basis). Data on past experience (e.g. inflation, salary increases, rate of return on investments, mortality and morbidity rates, retirement rates, in-patient/out-patient visits, frequencies and unit costs) should be taken into account by the actuary in developing appropriate assumptions about the future.

The data available for actuarial work should respect sufficiency and reliability criteria. Sufficiency means that data should enable an actuary:

- To develop appropriate demographic and economic assumptions to project and, where applicable, discount future cash flows of the social security scheme;
- To perform the required actuarial calculations;
- To validate and develop valuation and calculation methodologies;
- To analyse past demographic, financial and investment experience of the social security scheme so as to enable comparison of outcomes with social objectives and reconciliation of emerging experience with actuarial assumptions;
- To perform any other type of actuarial work deemed necessary by an actuary or by the social security institution.

Reliability means that data should be:

- Relevant;
- Complete;
- Up to date;
- Internally consistent;
- A sufficiently long series of the past;
- Consistent with data from other sources.

This guideline should be read in conjunction with *ISSA Guidelines on Information and Communication Technology*, in particular its Section A.5, Data and Information Management.

Principles

- The social security institution should define responsibilities for data management within the organization including who is responsible for the management of the process and peer review processes. The data management process should ensure security of data (including detailing back-up procedures) and that any legal requirements regarding data privacy are respected.
- Well-thought-through data requirements should be documented and justified. These requirements should take into account specific needs of the programmes that require actuarial work and the actuarial method and models adopted for the valuations. The documentation should:
 - Identify data elements;
 - Describe the use of data;
 - Provide sources of data.
- Social security institutions should have a well-documented and structured procedure on preparing data requests for external and internal data providers.
- Social security institutions should establish a well-documented and structured data validation process which will test internal data consistency as well as consistency with external sources (e.g. audited financial statements).
- The data collection should be undertaken using the seriatim approach. In the case where grouped data is used for the actuarial valuation, it is the responsibility of the actuary to determine the appropriate approach to group the data. The impact on the results of using grouped data as opposed to individual data should be assessed and communicated appropriately to relevant stakeholders.
- Lack of data, for example for a newly established social security scheme, presents a major challenge for social security professionals. In such situations, actuaries may need to rely on data from other sources and programmes. The actuary should coordinate with other agencies and stakeholders to ensure that the most appropriate data is used.

Mechanism

- The social security institution, administrators and actuary should have a clear understanding of the data requirements.
- The social security institution should ensure that the social security scheme administrator maintains a sufficient and reliable longitudinal database with respect to social security scheme participants.
- Regular data validation procedures should be performed. These should include appropriate “reasonability” checks to ensure consistency with data provided for previous actuarial analyses and for other social security schemes in the country where relevant.
- The data provided to the actuary should be in a format that is usable.

- When external data are required, the social security institution should facilitate the access to data held by other government agencies by:
 - Promoting the legislation enabling such access;
 - Entering into agreement with other institutions on the topic of data access.
- For newly established social security schemes and/or other situations where there is a lack of sufficient and reliable data, the social security institution should explore ways to enter into agreements with national and/or international institutions as well as third-party providers in order to obtain information that could address the data needs of the actuary.
- For both new and existing schemes, data may be incomplete or out of date. The actuary should liaise with the social security institution regarding the best approach to take in such a situation. This may include the use of approximations such as the use of average data. The actuary should detail and document the implications of such approaches on the accuracy of the analysis and communicate this analysis to the social security institution.
- The actuary responsible for the analysis should comply with national and/or international actuarial standards of practice and/or other relevant guidance including IAA ISAP 1 and ISAP 2 that describe data requirements, checking and validation procedures, use of incomplete data and disclosure of limitations, as well as other aspects related to the data.

Guideline 3. Assumptions

Assumptions used for a valuation of a social security scheme are sufficient to value the scheme in accordance with its financing objectives and consistent with the overall socio-economic environment of the country. The development of assumptions combines the analysis of historical trends with a forward-looking approach. Social security institutions assign major responsibilities to an actuary in the assumption-setting process. An actuary provides an opinion on the extent to which the assumptions used for actuarial work are reasonable and appropriate both individually and on an aggregate basis.

By their nature, social security programmes cover wide segments of the population. Thus, economy-wide and nation-wide economic and demographic assumptions are often needed for the purpose of performing social security valuations. The development of the assumptions for social security valuations is often a joint exercise that involves inputs from many parties: experts from social security institutions, various governmental organizations and independent bodies of experts. Moreover, some of the assumptions may be prescribed by legislation or provided by various governmental organizations.

Principles

- The social security institution should define the responsibilities for setting the assumptions. The role and responsibilities of an actuary in the process of setting the assumptions should be clearly defined.
- The social security institution should guarantee the independence of the actuary and ensure that no parties exercise undue influence. In particular, if the assumptions used do not represent the actuary's best estimates, alternative results based on best-estimate assumptions should be presented. Further, the justification for such a deviation from best estimate should be provided to the actuary if the impact is material.
- The assumptions needed for the valuation of a social security system should be identified, justified and documented. These requirements should take into account the following:
 - Provisions of the social security scheme;
 - Factors affecting demographic and economic characteristics of the population covered by the social security scheme;
 - Funding policy of the social security scheme and investment policy, if applicable;
 - Any policies and/or agreements that may affect the financing of the scheme (e.g. agreements with health services providers, collective agreements, etc.);
 - Methodology used to value the social security scheme, including the definitions of actuarial measures to be assessed;
 - Valuation model requirements.
- An actuary should assess the materiality of the various assumptions, that is, how significant are the magnitude and nature of the change in the valuation results when there are changes in the values of the different assumptions. This analysis should be used to determine the resources to devote in developing appropriate assumptions and alternative scenarios and, for example, indicating where broader estimations can be used. The resources (time, personnel

and financial) spent to develop individual assumptions should be balanced against the likely impact on the accuracy and reliability of results.

- The social security institution should ensure the access to relevant knowledge and sources of information necessary for the development of assumptions.
- The process for developing assumptions as well as the rationale for the final assumptions should be documented. Documentation should include:
 - Socio-economic context of the assumption;
 - Analysis of past trends and experiences;
 - Methods used to develop assumptions;
 - Basis for the assumptions, e.g. historical experience, judgement, legislative requirements, use of external expertise, etc.;
 - Final assumptions;
 - Comparison of assumptions to national economic plans and forecasts and demographic projections if they exist;
 - Sources of information used for the assumption-setting process.
- In the case of the assumptions prescribed by legislation (e.g. mortality rates, discount rates to be used for calculating actuarial reduction factors), the social security institution should ensure that these assumptions remain relevant in the context of the country's demographic and economic environment. If this is not the case, the social security institution should initiate the process of reviewing and updating legislated assumptions.

Mechanism

- The social security institution should provide the actuary with proper access to information and knowledge needed for developing assumptions. In particular, the social security institution should:
 - Facilitate access to national and international data on demographic and economic trends as well as short-term economic and financial forecasts from recognized national and international experts and organizations;
 - Ensure access to data on the social security scheme experience;
 - Facilitate cooperation of the actuary with national and international bodies of experts in areas relevant to developing assumptions.
- In cases where the assumptions used for the analysis do not represent the actuary's best estimates, the social security institution and other stakeholders should examine alternative results based on the actuary's best-estimate assumptions and document these results.
- Additional sets of assumptions demonstrating the uncertainty of results (as per Guideline 8) need to be developed.
- In the case of legislated assumptions, the social security institution should request that an actuary perform assumption experience studies (e.g. mortality studies) in order to assess the appropriateness of such assumptions. These experience studies should be conducted on a regular basis. The social security institution should ensure that data for such studies are statistically credible.

- For newly established social security schemes and/or other situations where there is a lack of the information needed to develop assumptions, the social security institution should explore ways to enter into agreements with other national and/or international social security schemes in order to obtain information that could meet the actuary's requirements.
- The actuary responsible for the analysis should comply with national and/or international actuarial standards of practice and/or other relevant guidance including IAA ISAP 2 that describe the assumption-setting process.

Guideline 4. Valuation methodology

The valuation methodology is consistent with the social security scheme financing approach and enables the actuarial assessment of its sustainability measures or indicators. The actuary provides an opinion on the appropriateness of the methodology.

The choice of the methodology used to evaluate the situation of a social security scheme is often the responsibility of social security institutions. Legislation may specify at least some elements of the methodology to be used. Actuaries should advise the social security institution and, ultimately, policy-makers on the choice of valuation methodology and appropriate measures of financial soundness (the latter is discussed in more detail in Guidelines 42 and 43). Specific considerations in assessing the financial situation of new schemes as well as reformed schemes are covered in Guidelines 40, 41, 43 and 46.

Principles

- The social security institution should assess different valuation methodologies to determine their:
 - Appropriateness for actuarial assessment of the sustainability of the social security scheme and of actuarial measures;
 - Appropriateness for other goals of actuarial assessment such as, for example, analysis of adequacy and affordability of benefits;
 - Consistency with the scheme's financing approach and funding policy;
 - Ability to assess whether the scheme's funding objectives (e.g. stability of contribution rate, benefit security, contributions or benefits levels) are achievable.
- The projection methodology should be flexible in order to be able to respond to potential changes in the system's design (e.g. changes in benefits provisions, indexation methods, eligibility requirements, combination of different benefits, preferred service providers, etc.).
- The social security institution should delegate the responsibility of assessing the appropriateness of valuation methodologies to actuaries or at least require formal actuarial advice on appropriateness of methodologies.
- In the case of a legislated valuation methodology, the social security institution, with the assistance of actuaries, should review on a regular basis its appropriateness.
- If the legislated methodology or any of its elements are found to be inappropriate, the social security institution should initiate the process of legislative amendments.

Mechanism

- The social security institution should define funding objectives for the scheme and/or develop sustainability measures. This should be undertaken taking into account the content of Guideline 42 on funding and financing considerations, and Guideline 58 of the *ISSA Guidelines on Good Governance*.
- The actuary should ensure that the valuation methodology properly reflects all sources of financing of the social security scheme, e.g. employers, employees and/or state contributions, earmarked general tax revenues, investment earnings, etc.

- The actuary should determine the appropriate length of the projection period. While increasing the length of the projection period may lead to more relevant, accurate and appropriate results, the longer the period, the more uncertainty exists surrounding the projections of cash flows.
- The actuary should make a decision whether open or closed group methodology should be used. Partially funded and pay-as-you-go (PAYG) schemes represent social contracts where, in any given year, current contributors allow the use of their contributions to pay benefits to current beneficiaries. As a result, such social contracts create claims for current and past contributors to contributions of future contributors. The proper assessment of the financial sustainability of a social security PAYG or partially funded system by different means (including through its balance sheet) should take into account these claims. The open group methodology considers contributions and benefits of current as well as future scheme participants and is considered to be most appropriate for PAYG and partially funded social security schemes. It can also be used for schemes whose objective is to fully fund benefits. The closed group methodology considers only current scheme participants and is appropriate only for schemes whose objective is to fully fund benefits.
- In the case of actuarial valuations of schemes that are based on contingencies (e.g. defined benefit pension schemes, disability programmes, health systems, etc.), the valuation methodology should be based on cohort-wide cash flow projections that take into account the evolution of the age-gender structure of the scheme's members and beneficiaries, as well as benefit provisions of the scheme.
- The actuary responsible for the analysis should comply with national and/or international actuarial standards of practice and/or other relevant guidance, including IAA ISAP 2, that describe the methodologies to be used for actuarial valuations.

Guideline 5. Projection model

The projection model is built on actuarially sound principles. It is capable of assessing the material provisions of the social security scheme, projecting its cash flows over the relevant projection period, and evaluating the chosen sustainability and adequacy measures, if appropriate.

Principles

- The social security institution in consultation with the actuary should determine whether a deterministic, stochastic or hybrid (deterministic with some stochastic elements) projection model should be used to conduct the valuation of the social security scheme. In addition, it should be determined whether the model should be a macro factor-based model, a microsimulation model based on transition probabilities or a hybrid of these two. More than one model can be used.
- The social security institution should determine whether an internally or externally developed projection model should be used. Such assessment should be undertaken at regular intervals and the result of the assessment should be documented.
- In case of the use of an internal model, actuaries should be involved in development, validation and maintenance of the projection model. The social security institution should provide appropriate resources to actuaries within the institution for developing a model internally.
- In case of the use of an external model which will be run by the social security institution staff, the selection process should be competitive and transparent. The model should be assessed for its appropriateness, as well as availability of training, documentation and ongoing technical support. Actuaries should be actively involved in the process. The social security institution should ensure that there is a full understanding of the model including the methodology used and the responsiveness of the model to different assumptions.
- Where an external resource is undertaking the valuation using an external model, the social security institution should ensure that the model used is appropriate and that the external actuarial resource using the model to undertake the valuation does so appropriately. This includes the existence of proper peer review processes within the external actuarial resource (see Guideline 48) carrying out the valuation.
- The social security institution and the actuary should establish proper model governance procedures. In particular, the projection model should be transparent and well documented.
- In developing model governance procedures the actuary should comply with relevant national or international standards, including IAA ISAP 1A: "Governance of Models".
- The social security institution should allocate human and budget resources to maintain the model, and to provide ongoing training and technical support.

Mechanism

- In making the decision whether a projection model should be based on deterministic or stochastic methods, an actuary should assess the advantages and disadvantages of both methodologies. Social security systems are often complex arrangements that are very difficult to model using fully stochastic methods. However, it may be worth considering incorporating

stochastic elements in the projection model as needed (e.g. in case it is necessary to measure distributional effects of benefits). In some cases several complementary models could be used.

- In deciding whether the projection model should be developed internally, the social security institution should assess the number of schemes for which the institution is responsible, the current and future availability of technical expertise, human resources and technological resources within the institutions needed to develop and maintain the projection model.
- Actuaries should develop detailed model requirements that will assist the social security institution in making decisions with respect to the choice of the model.
- Model requirements include, but are not limited to the following:
 - The ability of the model to handle a sufficient number of transitional probabilities that are related to contingencies relevant to the social security scheme (e.g. mortality, disability, morbidity, etc.);
 - Specific requirements with respect to projections of all elements of the social security scheme revenues and expenditures;
 - Requirements with respect to the length of projection period;
 - The ability of the model to perform projections that consider new entrants to the social security system (open group projections);
 - The ability of the model to perform projections based on large groups such as the country's population.
- Where the social institution is responsible for using the model, the institution should provide appropriate training with respect to the projection model to ensure that the proper technical expertise is maintained within the institution.
- In the case of the building and use of an internal model, this training should cover both design and operation of the model and the peer review of the results arising.
- In the case of the use of an external model where the valuation is performed within the social security institution, since the design is usually the full responsibility of the outside provider the social security institution's actuaries should take all necessary measures to ensure that they have a sufficient understanding of the model including methodology used and assumptions underlying its operation. Training should be provided in respect of the operation of the model and the peer review of the results arising.
- When changing the model (for example moving from an external to an internal model) the actuary should reproduce with the new model the results produced with the old model and explain any significant differences.

Guideline 6. Determining the value of the social security scheme's assets

The basis chosen for determining the value of the social security scheme's assets is consistent with the scheme's sustainability measures or indicators.

This guideline should be read in conjunction with Guidelines 23 and 24.

Principles

- The social security institution, with the assistance of the actuary, should choose an appropriate basis for the valuation of the scheme's assets. This choice should be documented and reassessed on a regular basis and be consistent with measures used to assess the scheme's sustainability.
- The actuary should provide input into decisions regarding the nature of reporting of asset values and accompanying explanatory notes.

Mechanism

- An actuary should identify proper sources of information for the value of assets (e.g. audited financial statements) and assess to what extent this information is appropriate for evaluating chosen sustainability measures.
- The basis for the valuation of the scheme's assets may include smoothing techniques in order to avoid temporary fluctuations in declared asset values and reflect asset values which are considered as more consistent with the long-term nature and time horizon of social security schemes.
- An actuary should make sure that the stated value of assets at the date of valuation properly reflects the schemes' revenues and expenditures over the appropriate period to ensure consistency between the determination of assets and liabilities. For example, the value of assets may need to be adjusted to reflect benefits and contributions paid or received after the valuation date, but allocated to the period prior to the valuation date.

Guideline 7. Reconciliation

The valuation of a social security scheme includes the reconciliation of the value of the sustainability measures, financial indicators and other relevant results between the previous and current valuations. As part of the risk management of the social security scheme, the social security institution examines the main drivers of the changes in results between successive valuations.

Reconciliation of the results of the two most recent valuations is a powerful tool that can help to identify emerging risks with respect to the social security scheme. It also serves as an internal control that helps to ensure the accuracy of the results.

Principles

- The social security institution, together with the actuary, should define sustainability measures, financial indicators and other results that need to be reconciled. These indicators should be chosen to be consistent with the scheme's funding policy. The selection of items to be reconciled should be documented and reviewed on a regular basis.
- The report on the valuation of a social security scheme should include a section dedicated to the reconciliation of the sustainability measures, financial indicators and other results between the two most recent valuations.

Mechanism

- The sustainability measures, financial indicators and other results that could be reconciled may include, but are not limited to, the following:
 - The difference between assets and actuarial liabilities (determined using the closed or open group methodology for fully funded schemes, or open group methodology for PAYG and partially funded schemes);
 - PAYG rates;
 - General average premium (GAP);
 - Relevant contribution rates;
 - Actuarial balance;
 - Total expenditures as a percentage of Gross Domestic Product;
 - Ratio of assets to expenditures.
- The reconciliation of some elements may require a projection of the previous valuation results.
- The causes of differences in the projections of two successive valuations should be explained as follows:
 - Differences between assumptions and experience since the last valuation. This process may help in making decisions regarding appropriate assumptions to use;
 - Changes in the assumptions between two valuations;
 - Changes in the methods between two valuations;
 - Major changes in the covered population;
 - Changes in the social security system provisions (e.g. changes in benefit rules or financing requirements).

Guideline 8. Uncertainty of results

The valuation of a social security scheme includes analysis of future uncertainties and their impacts on the scheme. An actuary identifies and, if possible, quantifies risks stemming from future uncertainties.

Uncertainty is intrinsic to the valuation since it addresses future events, and users of an actuarial valuation must be aware of this fact. The actuarial analysis of social security schemes is based on models as well as on a number of assumptions. Social security schemes are very complex and their future income and outgo depend on many economic and demographic factors, so the models will not be a perfect representation of future reality. Moreover, the projection of cash flows of social security schemes is performed over an extended future time period. With the passage of time, the emerging picture will almost certainly differ from the projections of any actuarial valuation.

The social security institution, as part of its risk management process, should identify future uncertainties and address the risks they pose to the social security scheme. This guideline should be read in conjunction with Part E of these guidelines.

Principles

- The social security institution in cooperation with the actuary should review on a regular basis the national and international demographic and economic environment and identify trends that could have a material impact on the social security scheme.
- In the case of a deterministic model, the actuary should develop different sets of alternative assumptions to quantify the impacts of risks identified by the social security institution in cooperation with the actuary.
- In the case of stochastic or hybrid models, uncertainty should be illustrated through the use of stochastic methods which estimate probability distributions of different potential outcomes by allowing for random variation in one or more inputs. Additional sets of alternative assumptions may be required.
- The report on the valuation of a social security scheme should include a section dedicated to the uncertainty of results.

Mechanism

- The relevance and reasonableness of sensitivity tests presented in the uncertainty of results section should be reviewed in each valuation.
- Sensitivity tests may include, but are not limited, to the following:
 - Sensitivity to variations in individual assumptions;
 - The use of optimistic and pessimistic scenarios;
 - Scenarios illustrating particular demographic and economic environments;
 - Scenarios illustrating tail events;
 - Stress testing.

- In developing sensitivity tests, an actuary may use a combination of stochastic and deterministic methods. Ultimately, the actuary should use his or her professional judgement to ensure the tests' reasonableness and relevance.
- An actuary should explore ways to efficiently communicate uncertainty to the social security institution and other stakeholders of the scheme. In this matter, reference should be made to Guidelines 25 and 28.

Guideline 9. Reporting

In preparing a report on the actuarial valuation of a social security scheme, an actuary considers legislative requirements and relevant professional standards and guidance, as well as the intended audience.

A report on the actuarial valuation of a social security programme could be considered as a final product of the actuarial valuation process. It is a tool that provides stakeholders with information necessary to make responsible decisions with respect to a social security scheme. As such, a social security institution as well as the actuary should make every effort to prepare a comprehensive, transparent and explicit report on the actuarial valuation. This guideline should be read in conjunction with Guidelines 11, 25, 26, 27 and 28.

Principles

- The report on the actuarial valuation should contain sufficient information to permit the conduct of the independent expert review (see Guideline 11) and to allow stakeholders to make sound decisions based on the results set out. It should be written in such language as to be understandable and unambiguous for all stakeholders, including those without an actuarial background.
- The report on the actuarial valuation should contain an opinion describing the actuary's views on the appropriateness of data, assumptions and methodology as well as other material elements of the performed work. This opinion should be signed by an actuary who fully meets the professional requirements for making such an opinion as set down by the national actuarial organization and recognized by the International Actuarial Association.
- The social security institution should ensure that reports on the actuarial valuation as well as any supplemental information with respect to the actuarial valuation are available in all relevant languages.
- Additional communication may be required in order to address needs of a more technical nature as well as to facilitate the understanding of the report by stakeholders.

Mechanism

- The actuary responsible for the analysis should comply with national and/or international actuarial standards of practice and/or other relevant guidance including IAA ISAP 1 and ISAP 2 that address the communication related to the actuarial valuation including the content of actuarial reports.
- The social security institution should allocate resources for communication and translation, if applicable, to assist an actuary in the preparation of the actuarial report.
- The social security institution and the actuary should discuss on a regular basis which areas of the actuarial valuation should be addressed through additional technical communication. As a result of such discussions, a schedule of additional reports (e.g. actuarial studies or educational notes) to be performed should be prepared.
- The social security institution and the actuary should determine which additional communication should be prepared in order to enhance stakeholders' understanding. Such communication may include, among others, glossaries, summaries of legislation, programme provisions and additional statistical information.

Guideline 10. Operational control

If a social security institution has an internal actuarial department, a regular audit of its operations is to be conducted. If a social security institution employs an external actuarial provider, the parties agree on the ways the social security institution monitors the appropriateness of the external provider's processes.

The quality of actuarial work, including the actuarial valuation, depends on the quality of internal processes of the internal actuarial department or external provider. As such, the social security institution should ensure that the appropriate operational controls are put in place.

Principles

- The social security institution should create a written policy in respect of the operational audit of the actuarial department. In particular, this policy should specify the following:
 - The main objective of audits;
 - The frequency of audits;
 - The processes to be audited;
 - The responsibilities of auditors and the actuarial component of the process.
- In the case of an external provider, the social security institution should specify as a part of the contract which external provider's processes will be monitored by the social security institution and how.

Mechanism

- The social security institution may conduct the operational audit of the internal actuarial department either by using internal auditors or by hiring external auditors.
- The operational audit should address, among other things, the following processes:
 - Data validation procedures;
 - Data protection procedures;
 - Internal peer review procedures;
 - Documentation procedures;
 - Data back-up and business continuity plans.
- The social security institution may decide to send its own auditors to review an external provider's processes. Alternatively, the social security institution may decide to rely on the results of an external provider's internal audit and/or assurance review by a third party. In all cases, the rationale for the chosen approach should be documented. The chosen approach should be reviewed and reassessed on a regular basis.
- Actuaries (both those internally employed and external providers) should cooperate with the operational audit and follow resulting recommendations as per Guideline 12.

Guideline 11. Independent expert review

A social security institution commissions on a regular basis an independent expert review of the work carried out in respect of the social security scheme valuation. The actuary responsible for the valuation fully cooperates with the independent reviewers.

Principles

- The social security institution should have a policy in respect of commissioning an independent review, by external experts, of the work carried out in respect of the social security programme valuation. In particular, this policy should specify the following:
 - The frequency of independent expert reviews;
 - The Terms of Reference;
 - The reviewers' selection process;
 - The competencies, experience and skills of the reviewers;
 - The timing of the review;
 - The deliverables of the review.
- The reviewers' selection process should be transparent. The social security institution should ensure that the reviewers are independent from the institution.
- The social security institution should direct the actuary responsible for the valuation to clearly and effectively communicate with the independent reviewers.

Mechanism

- The Terms of Reference of the independent expert review should address, but are not limited to, the examination of the following areas:
 - Qualifications of professionals involved in the valuation work;
 - Compliance with relevant standards of practice and statutory requirements;
 - The availability and quality of data used for the valuation work;
 - The reasonableness of methods and assumptions;
 - Quality of the communication of the results of the valuation work.
- The selection process of the independent expert reviewers should ensure that qualified individuals are selected. The social security institution may wish to delegate the selection of reviewers to an independent third-party entity. Alternatively, the social security institution may engage independent professionals from recognized entities to perform the review.
- The independent expert reviewers should prepare a report which expresses opinions on all items included in the Terms of Reference, and should produce, as appropriate, a detailed list of recommendations for modifications and/or improvements in the valuation work and processes.

- The independent expert review should be timed in such way as to allow the social security institution and actuary responsible for the valuation to analyse and implement, if applicable, the review's recommendations.
- In communicating and coordinating with independent expert reviewers, the actuary responsible for the valuation should comply with national and/or international actuarial standards of practice and/or other relevant guidance including, in particular, IAA ISAP 1 and ISAP 2.

Guideline 12. Following the recommendations of the operational audit and independent expert review

The social security institution addresses and ensures implementation in a timely manner of the recommendations made by the operational audit and the independent expert review.

Principles

- The social security institution should ensure that actuaries have the resources needed to address the recommendations arising from the audit and independent expert review.
- The implementation of recommendations should be appropriately monitored.
- If the social security institution decides not to implement recommendations from the audit and/or independent expert review the reasons should be fully documented.

Mechanism

- The social security institution and the actuary completing the valuation should review the recommendations and determine which ones are within their control.
- The social security institution and the actuary completing the valuation should prepare a plan to implement the recommendations as appropriate. This plan should include identifying the parties responsible for the implementation, the actions to be taken, the time frame for the implementation and the expected outcomes.
- Responses to the recommendations should be provided to appropriate parties (board (if any), management, internal auditor, independent expert reviewers, etc.). These responses should describe the actions taken and outcomes of these actions. The responses should, as necessary, also provide the rationale for not addressing specific recommendations.

B. Operational Management of Social Security Systems

The actuary is likely to play a major role in issues relating to the day-to-day management and operations of the social security scheme. These roles will include the calculation of benefit entitlements for individuals and the factors to apply in certain situations. The methodology and assumptions used as well as appropriate peer review processes are crucial. The deliberations of the actuary will have a significant impact on the adequacy of benefits and the sustainability of systems.

The guidelines in this part cover these issues in the determination of appropriate factors and benefit entitlements in different situations.

Guideline 13. Determination of benefit entitlements

The social security institution calculates benefit entitlements according to the provisions of the laws and regulations governing the scheme. All actuarial calculations necessary to calculate benefit entitlements are carried out in accordance with generally accepted actuarial principles, and an appropriate peer review process is established.

The role of the actuary may include the calculation of benefits as well as the determination of certain factors required for the determination of benefit amounts. This guideline should be read in conjunction with Guideline 14 and with Guideline 19 of the *ISSA Guidelines on Information and Communication Technology*.

Principles

- The social security institution should take necessary steps to ensure that members of the scheme receive the benefits they are entitled to according to the provisions of the laws and regulations governing the scheme, and that these benefits are based on members' individual historical records of contributions, earnings and credited service.
- The calculation of social security benefits often requires actuarial input. Such input includes, but is not limited to, calculation of lump sum equivalents of income streams, calculation of annuity values, calculation of rates of returns credited on accounts, calculation of actuarial equivalence factors, calculations related to change in family situations and calculation of survivor benefits. Actuaries should be involved in the development and maintenance of calculation modules needed for the determination of benefit entitlements as well as the determination of actuarial factors used to calculate benefits.
- Actuarial assumptions used for calculation of benefit entitlements and actuarial factors should be reasonable, appropriate and relevant.

Mechanism

- The social security institution should put in place the necessary procedures to ensure that the data used for the determination and calculation of benefits are complete, accurate and verified. Key data used for benefit statements should be summarized to allow the beneficiary to check that they are correct. This may include date of birth, family status and salary and contribution records.
- Calculation of benefit entitlements should be, as much as possible, automated to avoid manual data entries and the incorrect application of formulae or benefit factors. However, there should be appropriate reasonableness and random manual checks of such calculations to ensure accuracy. All manual data entries and calculations should be checked by other administrative and/or actuarial staff. The actuary should assist in the development of calculation modules and benefit factors. The *ISSA Guidelines on Information and Communication Technology* provide more details regarding the quality of data to be used and how the processing of this data should be managed.
- In order to mitigate any reputational risk, the social security institution should formulate the policy concerning the way errors in benefit calculations are addressed. If an error in a benefit is detected after or during the course of payment, the error should be corrected to bring the

benefit in line with the legislation or benefit rules. In the case of an underpayment of a benefit, the error should be corrected retroactively. In the case of an overpayment, the social security institution should consider how the amounts overpaid are to be treated. The actuary should ensure that amounts due or owed, if any, are properly calculated and appropriate interest assumptions are used for late settlement.

- The actuary should review on a regular basis the actuarial assumptions used to determine benefit entitlements and to calculate actuarial factors.

Guideline 14. Determination of actuarial factors

Actuarial factors are determined in accordance with generally accepted actuarial principles. There is no unjustified or unfair discrimination in the calculation of factors.

This guideline refers to the calculation of factors used to determine benefit entitlements in defined benefit schemes. These factors include but are not limited to early and late retirement factors, conversion rates of lump sum to periodical payments and vice versa as well as the determination of total and partial disability benefits and other social security benefits.

Principles

- The actuarial factors should be based on assumptions and methodology that follow applicable actuarial standards. There should be no unjustified discrimination in the calculation of factors.
- Actuarial factors should be based on the appropriate gender basis and not result in unjustified gender discrimination. When actuarial factors are not gender-neutral, the actuary should inform the social security institution of the impact of using sex-distinct actuarial factors on the benefits provided to male and female beneficiaries and more specifically the impact on benefit adequacy. When such factors are gender-neutral, the actuary should assess any material implications for the financing of the scheme and any adverse incentives that gender-neutral factors may create.
- Actuarial factors should be, in principle, cost-neutral. However, there may be instances where a policy decision is made by stakeholders to use actuarial factors that are not cost-neutral (for example, early/late retirement factors used to support certain employment policy objectives). In addition, legislation and/or actuarial standards may prescribe use of the assumptions for particular types of calculations (e.g. calculation of the lump-sum entitlements). In such cases, the actuary should assess the cost implications of the use of factors which are not cost-neutral.

Mechanism

- Gender-neutral actuarial factors should be calculated by using a unisex mortality table, which is produced as an appropriate weighted average of male and female tables reflecting the gender distribution of the scheme's participants.
- In order to be cost-neutral, actuarial factors should be calculated using the same assumptions as those used in the actuarial valuation.
- Future improvements in mortality rates are usually taken into account in the actuarial valuation. Using the same mortality improvement assumptions for the calculation of actuarial factors would imply using different dynamic factors for different cohorts and may be too complex to implement for the administration of the scheme. To simplify the administration, mortality rates used for the calculation of actuarial factors could be kept constant for a given number of years. The cost implications of such an approach should be assessed.
- In case actuarial factors are not cost-neutral to the scheme, the financial impact of using this approach compared to the use of cost-neutral factors should be communicated to the stakeholders in order for them to make an informed decision on assumptions to be used.
- While it is important to reflect appropriately the current economic and demographic environment in assumptions used, it is likely that the institution and/or policy-makers will seek

to ensure stable factors over time. Therefore, factors used could differ from true cost-neutral rates at certain points and the actuary needs to assess the impact of these differences on the financing of the scheme.

- In certain funded systems, an amount paid out when a beneficiary leaves the system, reflecting the accrued rights in the system, needs to be determined. In some instances, an adjustment to take into account market conditions will be made. The actuary should advise which factors to apply in determining the benefit pay-out.

Guideline 15. Determination of rate of return to be credited to provident fund accounts and the resulting financial implications

In determining the rate of return to be credited to provident fund accounts of beneficiaries the actuary considers relevant factors, the impact of decisions on the sustainability of the scheme and the adequacy of benefits. The actuary uses his or her judgement in developing appropriate assumptions and methodology and in making recommendations.

While the key principle underlying the operation of provident funds is that the sum of provident fund accounts balances should broadly be equal to the total value of assets in the fund, a range of factors and the impact of varying policy aims means that the return credited will likely differ from the returns actually achieved on assets. The rate of return to be credited to provident fund accounts of beneficiaries depends on factors such as legislative requirements, the design of the scheme, the returns actually achieved on underlying assets, the smoothing policy and the amount of investment reserves held, if any. This guideline should be read in conjunction with Guidelines 6, 21 and 23.

Principles

- Where the rate of return credited to provident fund accounts is guaranteed or set by legislative instrument or scheme rules and is not directly related to returns on underlying assets, the actuary will need to appropriately assess the resulting financing and adequacy implications.
- Where the rate of return credited to provident fund accounts is decided by the social security institution or governing authority on the recommendation of the actuary and/or other professionals, the actuary should use a methodology that ensures that his or her recommendations are appropriate. The actuary should provide recommendations on the rate of return to be credited and determine and declare any investment reserves required.
- The actuary should liaise closely with other professionals, in particular those involved in the investment function and the administration function, and ensure that the data used for calculations are appropriate.

Mechanism

- Where it is the responsibility of the actuary to recommend a rate of return to credit to accounts, the calculation for a given year of the rate should be equal to the actual rate of return of the fund, net of an allowance for expenses and any allocation to investment or other reserves. These recommendations should take into account the actuary's view on the adequacy of current reserves and the proportion (if any) of the return achieved on scheme assets in the accounting year to be assigned to investment reserves.
- Where the credited rate of return is determined by scheme rules or legislative instruments, the actuary should determine the financial implications for the provident fund by considering the actual returns achieved on underlying assets, expenses and reserves. This is likely to include recommendations regarding the adequacy of investment reserves which may exist to manage fluctuations in underlying asset values. This is particularly important when the prescribed return to credit to accounts is materially different from the return achieved on underlying assets.

- In respect of beneficiaries who leave the scheme during the accounting period as a result of retirement or termination of membership, an appropriate credit should be awarded for the period between the end of the preceding year and the date of withdrawal. Given the difficulty of having the necessary data in advance for the calculation of the rate of return, the actuary should establish a procedure to estimate as precisely as possible the actual rate of return. The actuary should give consideration to whether a market adjustment factor should be applied in periods where there is a significant fall in the value of underlying assets in order to protect the fund. However, such a factor should only be applied in exceptional cases and where there is a voluntary departure from the provident fund scheme. The actuary should advise whether such a factor is necessary when there is a significant increase in the market value of assets.
- In assessing the adequacy of investment reserves at accounting year end and making relevant recommendations, the actuary should determine reserves using appropriate assumptions and methodology.

Guideline 16. Determination of rate of return to be credited to notional accounts and resulting financial implications

The rate of return to be credited to notional accounts is determined in accordance with the laws and regulations governing the scheme. The actuary ensures the correct application of the rate and performs related calculations to assess the adequacy and financial implications of returns credited.

Principles

- The rate of return to be credited to notional accounts (“indexation” or “valorization” of the accounts) is likely to be set out in relevant legal instruments or scheme rules. The actuary should ensure that the returns are calculated correctly and are appropriately applied to beneficiary accounts. There should be an appropriate peer review process which is documented and monitored.
- The indexation approach adopted has an impact on benefit adequacy and the financing of the scheme. The actuary therefore needs to assess periodically these impacts and provide relevant recommendations and reports to stakeholders. These may include the impact of using different indexation approaches, the use of different indices as an indexation or valorization basis, and impacts of the assumed evolution of current indices, as well as impacts of other factors (e.g. salary increases).

Mechanism

- The index used for the determination of the rate of return to credit to notional accounts should be consistently applied from one year to the next.
- The index to be used, where such choice is not prescribed by the relevant legislation and/or scheme provisions, and the calculation methodology of the index, should be clearly defined in order to avoid any misinterpretation or manipulation and to allow peer review. The actuary should highlight where there may be a possibility of bias in the index.
- Where the choice of index is not prescribed by relevant legislation and/or scheme provisions, the social security institution should use or recommend the use of an index that can be easily calculated and verified based on available and credible data.
- The actuary should determine and verify the rate to be used to credit individual notional accounts and ensure that the calculation of the absolute increase in account value is carried out correctly. The process should be peer reviewed.
- For beneficiaries who do not participate during a whole calendar year in the scheme, the actuary should determine correctly the partial credit to award.
- The implications of the current year rate of return credited on the financial position of the system, as well as the adequacy of current and future benefits, should be assessed. The actuary should assess the impacts using appropriate bases and undertake sensitivity analyses.

Guideline 17. Supervision of individual funded accounts

The social security institution or other governing institution plays a role in the monitoring and surveillance of defined contribution schemes, as appropriate.

A funded defined contribution element is present in many retirement systems. However, social security institutions generally do not play a direct role in the management of this element of benefit provision. While issues relating to the design of systems are set out in Part G, this guideline refers to the supervision and policy aspects, including the setting of bases and methodology for determining returns that funds should credit to member accounts, review of providers and assessing adequacy of future benefits. This guideline should be read in conjunction with Guidelines 18 and 44.

Principles

- The role of the social security institution, if any, is likely to be of a supervisory or policy nature. Responsibilities may include the determination of minimum absolute or relative rates of return to credit, the setting of maximum expense charges for defined contribution pension plans and investment restrictions for such funds, as well as the assessment of future benefit levels arising from individual funded accounts. The assessment and monitoring of the defined contribution schemes' providers is likely to fall under the remit of other bodies although the social security institution may input into this process.
- Unless there are minimum rate of return guarantees, for any given period the rate of return credited to individual funded accounts should be equal to the actual return achieved on underlying assets net of all expenses. Contrary to the practice of provident funds, and in the absence of legal requirements, there is generally no inherent smoothing in the operation of individual funded accounts.
- The social security institution should assess on a regular basis the current and future projected level of benefits generated by individual funded accounts. This is likely to require consideration of all elements of the country's retirement income system.
- Prescribed conversion rates of individual account balances to income may also be set by the governing institution, which will require actuarial input. While these rates need to be determined using appropriate assumptions, other policy objectives are likely to be taken into account in the consideration of the rates to use.
- The actuary should provide input where appropriate to the social security institution and other stakeholders, such as policy-makers and fund providers, in the administration requirements related to the management of individual funded accounts.

Mechanism

- The social security institution or overseeing institution should require the scheme's providers to administer individual funded accounts in such a way that the account values are available on a daily basis and the calculations of returns (and associated expenses) are transparent and verifiable.
- The actuary may assist in developing the approaches that funds should use to determine returns. This includes how asset returns are to be determined and the calculation of charges reflecting expenses and other allowable charges of the fund.

- In respect of investment returns, the actuary may set down the basis under which underlying assets are to be valued, including approaches to take where there is no market value available for certain asset classes.
- In respect of expenses, the actuary may set down maximum charges (e.g. as a percentage of contribution amount and/or as a percentage of account value) that can be used. These considerations should take into account the overall policy objectives and appropriate assumptions regarding the future growth of accounts (e.g. investment return assumptions, contribution rates and salary increases) and the impacts of expenses on account values.
- In respect of investment limits, the actuary may input into the consideration of allowable investments, maximum percentage of total assets in one asset class and diversification criteria. The actuary should work with appropriate stakeholders (e.g. investment experts, policy-makers) to determine such investment limits, which should be reviewed on a regular basis.
- In respect of setting conversion rates either prescribed or not, appropriate mortality, investment and other assumptions should be used. However, other policy objectives may also be taken into account (e.g. benefit adequacy, simplification of approaches, etc.) in the determination of rates. Where conversion rates are not based on best estimates, an assessment of the impact on benefit levels and financing needs to be undertaken.
- In respect of benefit adequacy, the actuary should use appropriate assumptions and methodology to assess projected values of individual accounts. In determining the rate of conversion of individual accounts to income, the actuary should follow Guideline 18. The actuary should perform sensitivity analyses that should include, but not be limited to, sensitivity of outcomes to changes in the major assumptions such as rate of return, salary increases and mortality.

Guideline 18. Determination of rate of conversion of lump sums to income

Where it is the responsibility of the actuary, he or she uses appropriate methodology and assumptions to determine the conversion factors of lump sums to income. Unless these factors are set so as to meet specific policy objectives, they are determined as cost-neutral. If the factors are not cost-neutral, the actuary discloses this fully and determines and reports on the implications on adequacy and sustainability of the scheme.

The rate of conversion of lump sums into annuities is an important element of provident fund, notional defined contribution and funded defined contribution schemes. In a provident fund or funded defined contribution system, a lump sum based on the account balance of the scheme member at the time of retirement may be paid. In such situations, the post-retirement risks, namely investment and longevity risks, are fully borne by individual scheme members. When a provident fund or funded defined contribution system converts individual accounts to guaranteed income streams, the fund bears the longevity and investment risk. In a notional defined contribution scheme, the conversion of the value of the account is usually governed by the scheme's rules and also has significant implications for sustainability and adequacy of benefits.

This guideline should be read in conjunction with Guideline 14 and with reference to Part E.

Principles

- The conversion rates should be set using appropriate investment and mortality assumptions that take into account future expected developments including mortality improvement rates. For provident funds and defined contribution schemes, these, in turn, will be set according to the underlying investment portfolio and based on the mortality table relevant to the covered population. For defined benefit schemes, these assumptions should be consistent with the actuarial assumptions adopted in the most recent actuarial valuation. Where converting a lump sum to a retirement income is voluntary, appropriate consideration of selection bias should be undertaken.
- The rates of conversion should generally be unisex in order to provide non-discriminatory benefits to males and females. When gender-specific rates of conversion are used, the actuary should inform the social security institution of the impact on benefits and, more specifically, on benefit adequacy. When unisex rates are used, the financial impacts and the risk these could pose to the programme should be properly assessed and communicated.
- Where the conversion rates are set or prescribed by regulation, the actuary should assess the financial implications on the programme of using rates that are not actuarially neutral.
- The impact of anti-selection and appropriate risk compensation mechanisms should be considered, particularly in programmes where conversion to retirement income is voluntary for some or all of the accumulated benefit. The anti-selection may arise as a result of using gender-neutral rates, as well as the difference in members' health status, and therefore difference in mortality.

Mechanism

- In determining the conversion rate, the actuary should use the most appropriate investment assumptions. For example, the provident fund may seek to minimize investment risks by adopting a minimal-risk portfolio with adequate cash flows that will match the annuity payments. Such investment strategy should be reflected in the choice of assumptions used. Reference should be made to Guideline 21.
- The mortality rates to be used for the determination of conversion rates should be, in principle, based on those used in the most recent actuarial valuation, if any, and be representative of the covered population. Mortality rates to be used for the calculation of actuarial factors should take into account future mortality improvements. However, where the purchase of annuities is optional, the impact of anti-selection should be reflected in the mortality rates assumed. The impact of such anti-selection may be significant and needs to be quantified by the actuary.
- While it is important to reflect appropriately the investment and mortality environment in the assumptions used, it is likely that the institution and/or policy-maker will seek to ensure stable rates over time. Therefore, rates used are likely to differ from true cost-neutral rates at certain points and the actuary needs to assess the impact of these differences on the financing of the scheme.
- As an alternative to retaining the investment and longevity risks, the social security institution may seek to transfer some or all of these risks to an insurance company or other third-party risk provider through the purchase of a relevant product. Options include a full buy-out, buy-in, longevity swaps or bulk risk transfers. While the costs will reflect the rates negotiated with an insurance company, the conversion rate offered to beneficiaries is likely to remain fixed. Therefore, even if some of the investment and longevity risk is transferred to the third-party provider, there is an element of risk retained related to the difference between the implicit rate agreed and those provided to beneficiaries. In addition, there is a risk retained by the original scheme related to the possibility of bankruptcy of the insurance company, and the social security institution should select the insurance company using appropriate due diligence similar to the process discussed in Section D.2 of the *ISSA Guidelines on Investment of Social Security Funds*.

Guideline 19. Automatic adjustment mechanisms

The social security institution applies automatic adjustment mechanisms in accordance with the laws and regulations governing the scheme. The social security institution analyses how the application of these adjustment mechanisms affects benefit adequacy and/or the financial sustainability of the scheme.

Automatic adjustment mechanisms link certain decisions on benefits and financing to internal or external parameters or indicators. This guideline should be read together with Guideline 43.

Principles

- The purpose of automatic adjustment mechanisms is generally to ensure that the adequacy of benefits and/or the financial sustainability of a scheme appropriately reflect changes in internal or external parameters. The aim may include streamlining decision-making mechanisms, supporting sustainability and improving the security and adequacy of benefits. Although some countries seek to ensure that important decisions are independent of political or other interference, for other countries the recommendations arising from the application of automatic adjustment mechanisms are subject to (political) approval.
- The actuary should be involved in the development of appropriate automatic adjustment mechanisms and their application.
- The actuary should assess the impact of the automatic adjustment on benefit adequacy and the financial sustainability of the system after any automatic adjustment takes place or is proposed.
- Good communication to members is necessary in order to maintain their confidence in the scheme, and the actuary should be involved in the formulation of this information.

Mechanism

- The social security institution should ask the actuary to analyse the impact of the automatic adjustment. Depending on the design of the automatic adjustment mechanism, the actuary should decide whether this analysis should be performed using only best-estimate assumptions or using a combination of best-estimate assumptions and a probabilistic distribution of outcomes. Sensitivity analysis should be carried out.
- The social security institution should communicate in advance to members the automatic adjustment mechanisms, their purpose, how they function, and the result and impact of the automatic adjustment mechanisms, particularly on benefit levels (e.g. the percentage of the adjustment and how it is calculated). Guidelines 27 and 28 as well as the *ISSA Guidelines on Communication by Social Security Administrations* should be followed.

C. Investment Issues

Although financing policy varies by social security institution, many systems will have reserve funds that require effective management, whether these have a short or longer term time horizon. As populations age and the external investment environment becomes more complex, the importance of a well-managed reserve fund increases. Increasing focus on investment governance is likely to continue and professionals involved in the investment process need to ensure that their input is carried out appropriately.

The actuary has an increasingly important role, in cooperation with other professionals, in the management of reserve funds. The actuary is also likely to be involved in a number of different areas relating to the investment process. It is important that any analysis is undertaken using generally accepted actuarial principles, in particular in relation to methodology and assumptions used in any calculations. Proper peer review processes should exist, and working closely with other professionals in the investment governance process, communication and reporting as well as other areas of the investment process where actuarial input is sought will be essential. Actuarial input into the appreciation of risk and its impact on the investment activities of the institution is also likely to be valuable. The investment function of the social security institution should always take into account actuarial opinion and input on relevant issues and there should be regular and close cooperation between departments as appropriate. The investment policy and strategy should be set in accordance with the liability profile of the scheme (see Guideline 21) and there should be close collaboration between the investment function and those responsible for the actuarial valuation.

The *ISSA Guidelines on Investment of Social Security Funds* covers issues relating to the investment governance process, and many of the guidelines and supporting resources will be relevant to actuaries involved in the investment process. Explicit reference is made to these investment guidelines in this part where appropriate. Actuaries involved in the investment process are also advised to consult other relevant documentation highlighted in this part. Appropriate coordination and collaboration with other staff involved in the investment process is also critical.

Actuarial input may also be desirable or mandated in other areas including the monitoring and regulation of supplementary funded provision, system adequacy projections, costing of certain systems and benefit factor calculations. In such cases, appropriate assumptions and methodology to assess current values and project appropriately future estimations of asset value should be used. This should seek to ensure that actuarial input is not only appropriate but that the approach is consistent with other areas of actuarial input (most notably regarding methodology and assumptions).

Guideline 20. Investment governance

The requirements for actuarial input and the role of the actuary are clearly defined in the investment governance framework.

Governance refers to the process of decision-making, control and monitoring of the processes carried out by an organization. Its aim is to ensure risks are known and managed effectively as well as improving efficiency of processes.

Actuarial input is increasing in magnitude and importance in many investment areas. The actuary's involvement in the governance structure and investment processes of the social security institution should therefore be sought.

This guideline considers, at a general level, the different elements of investment governance where actuarial input is likely to be required. This guideline should be read in conjunction with the *ISSA Guidelines on Investment of Social Security Funds*, Guidelines 1 to 5 inclusive, which describes in more detail the general governance issues set out below.

Principles

- The social security institution should document the different activities linked to the investment process. It should define responsibilities for the carrying out and reviewing of these different activities. These responsibilities should be well documented and reviewed regularly.
- Within this framework, the requirement for actuarial input and/or the involvement of the actuarial department should be specified.
- The actuarial department (if existing) within the social security institution should ensure that its own work plan and defined responsibilities for its staff are consistent with the requirements of the investment function of the social security institution. It should identify in each area of involvement which competencies are required for the carrying out of the tasks. Where there are gaps in competencies and/or experience, a detailed plan should be put in place to indicate how these gaps could be closed. Where external review or input is recommended, this should be indicated.

Mechanism

- The social security institution should ensure that the investment beliefs, mission and objectives are clearly stated, documented and reviewed on a regular basis. The formulation of the objectives and beliefs should be agreed by all parties involved. Where there is a contradiction between beliefs, a priority should be assigned to the different beliefs.
- The implications of the beliefs and investment objectives for the investment process, management of the investment process, asset selection and reporting should be assessed and documented.
- The responsibilities of different employees of the social security institution should be clearly documented and available internally to all those involved in the investment process. Responsibilities will include executive, management and/or administrative roles as well as peer reviewing processes. These responsibilities may be determined or influenced by legal instruments or regulations which need to be taken into account in the detailed description of

tasks and their application. The role of the actuarial department or actuary will feature in the document setting down the responsibilities.

- There should be an adequate governance budget for each element of the investment process. The budget will include financial resources, skills, experience and abilities. Those involved in the investment process, including actuaries, should therefore have the necessary competencies and experience in order to be able to carry out their role effectively. The institution should set down the requirements in these areas and detail efforts (e.g. training) to address situations where the level of competencies or experience does not meet these minimum requirements. Where external (to the social security institution) resources are required, these should be detailed and budgeted.
- The peer review process should be carefully documented and include which decisions are to be reviewed, the mechanisms of review, the frequency of review and staff involved. The role of the actuarial department or external actuarial resources should be specified.
- Actuarial input is likely to be particularly valuable in aspects relating to the valuation of assets and liabilities, the appointment of third-party providers in certain areas (e.g. investment managers), the formulation and monitoring of the investment strategy of the institution, the assessment of risks and the measurement of performance of assets. In addition to this technical input, the actuary is likely to input into the overall investment governance structure of the institution, given his or her overview of the different processes and appreciation of risk. The mechanisms by which such input is solicited should be set down by the social security institution and reviewed regularly.
- The actuary may also be asked to carry out or input into the monitoring and regulation of supplementary funded provision, system adequacy projections, costing of certain systems and benefit factor calculations. When carrying out these tasks, appropriate methodology and assumptions should be used in any asset valuations performed. Appropriate coordination with other parties involved (e.g. investment managers, regulators) is important and how this coordination is carried out should be defined.

Guideline 21. Taking into account liabilities in the investment process

The social security institution ensures that the scheme liabilities are taken into account in the investment process.

A key driver of investment decisions is the timing, level and nature of net cash flows of the social security scheme and how these will evolve in the future. Therefore, the actuary will have a significant role in estimating the future cash flows of the scheme and interpreting these for the investment process. These cash flows consist of future benefit payments, contributions received, expenses and income from assets and other sources. Appropriate modelling can be conducted to determine an investment strategy that is likely to meet the social security institution's mission and goals. While there is a clear link to the calculations and projections carried out as part of the actuarial valuation process (see Part A of these Guidelines), the actuary is also likely to input into more specific investment analyses relating to future benefit and expense cash flows (for example, Asset Liability Management(ALM)) which will provide an important input into the development of investment strategy and the management of the process.

This guideline should be read in conjunction with Guideline 6 of the *ISSA Guidelines on Investment of Social Security Funds*.

Principles

- The role of the different stakeholders involved in the determination, analysis and reporting of cash flows should be documented. The actuary should liaise effectively and efficiently with other stakeholders in this regard.
- An assessment of the competencies of each stakeholder relating to the task assigned should be carried out and any gaps should be identified. Where there are gaps, a plan should be set down and carried out to assess actions to address them.
- Clear reporting lines and peer review processes should be set out. The competencies required of each of the stakeholders should be documented and regularly reviewed.
- The actuary should prepare the projections of the scheme's liabilities and cash flow in accordance with generally accepted actuarial practices and standards.

Mechanism

- The cash flow projections from future benefit obligations and expenses should be determined by using an appropriate methodology and assumption basis. These bases should be documented and reviewed regularly in accordance with relevant good practice and actuarial standards. Considerations regarding methodology and assumptions to use (e.g. open versus closed group valuations) are covered in Guidelines 3 and 4.
- When future cash flow projections are taken from the most recent actuarial valuation, they should be updated to the analysis date using appropriate assumptions.
- When approximate projections are undertaken, or a proxy value of liabilities used, the basis of the calculations and assumptions (e.g. average service) should be stated. An analysis of discrepancies between previous approximate projections and actual experience should be carried out.

- The actuary should perform appropriate analysis to model potential variations from the base case projections in future asset cash flows. This analysis should use appropriate methodology and assumptions reflecting at least three different scenarios (for example, “optimistic”, “pessimistic” and “extreme”). The different factors affecting variations in future cash flow amounts and timings should be considered (e.g. inflation).
- The analysis should take into account the funding policy of the social security scheme. Given that most social security systems are only partially funded, an analysis of the relevance of ALM and how the process should be carried out to reflect the partial funding should be considered and documented.
- It is important that the actuary works closely with other professionals and experts within the social security institution, such as investment managers, auditors, the risk function, the finance function and other relevant members of the institution.
- The actuary and the social security institution should also closely cooperate with other scheme stakeholders and decision-makers to ensure that the results of the ALM are understood and properly reflected in decisions taken.
- In his or her input to the process, the actuary should document the data, assumptions and methodology used, identifying where approximations or estimations have been used. Where events that cannot be measured or quantified but may materially affect outcomes exist, these should be considered separately and explicitly. These risks may include investment manager risk, third-party risks or benefit reform risks. Results should be set out clearly regarding alternative scenarios and sensitivity analyses.
- The analysis should be carried out on a regular basis, the frequency being consistent with the size of the scheme’s liabilities and assets, liquidity requirements, the nature of the assets held, the funding policy, the resources within the institution, and any other relevant constraints or objectives.

Guideline 22. Investment management processes

The social security institution involves actuaries in different areas of the investment process. This guideline refers to the situation where actuaries are directly involved in the design and carrying out of an investment strategy in respect of the reserve funds of the social security scheme.

This guideline considers the different elements of the investment management process where actuarial involvement is likely to be solicited. The investment process is likely to include a number of different steps and be relatively complex in its planning, management and execution. For each of the elements where actuarial input may be required or demanded, it is important that this role is detailed and that it is carried out taking into account appropriate actuarial methods and approaches. A number of the processes detailed below require coordination and collaboration with other professionals and stakeholders both within and outside the institution. Such coordination should be effectively managed and proper peer review processes put in place and executed.

This guideline should be read in conjunction with the *ISSA Guidelines on Investment of Social Security Funds* (appropriate guidelines are identified below) as well as Guidelines 2, 3 and 4 data, assumptions and methodology respectively.

Principles

- The social security institution should seek to involve the actuary in certain areas of the investment process. The role should be defined and monitored on a regular basis, with the level of experience and competency of the individual defined.
- The institution should facilitate the sharing of information and collaboration between the different stakeholders involved in the investment process.

Mechanism

The areas of the investment process where actuarial input may be required include:

- Defining the risk budget and its utilization (Guidelines 7, 11, 12, 13 of the *ISSA Guidelines on Investment of Social Security Funds*):
 - A risk budget is the amount of investment risk, relative to liabilities, an investing institution wishes to take. The assessment of risk in general and the risk budget in particular is often a key area of actuarial involvement in investment management, and this process assists the institution in understanding the level of risk taken on. Once defined, it will be used to develop a strategic and dynamic asset allocation for the institution. The actuary may also input into strategies to re-balance risk levels which may arise due to changes in the value of assets and/or changes in the scheme's obligations (for example, when benefit rules change);
 - General elements to consider in risk management are set out in Part E. In identifying and quantifying the different elements of risk, the actuary should consider which are the most appropriate methods to assess risk and should work closely with the risk function within the institution as well as the investment management function (internal or external) to ensure this analysis is relevant.

- Choosing appropriate assumptions and methodology for asset valuation and analysis (*ISSA Guidelines on Investment of Social Security Funds*, Guideline 20):
 - Guideline 20 of the *ISSA Guidelines on Investment of Social Security Funds* considers in more detail the valuation of assets. Although the selection of appropriate methodology and assumptions is a key element of the process, it is important that decisions are taken with the involvement of relevant stakeholders, as the financial implications are likely to be significant. Such stakeholders may include asset managers, custodians, the finance function and the risk function as well as the board or other decision-making body in the institution. The assumptions and methodology used should be in accordance with international or national actuarial standards (and accounting standards, if relevant).
- Selection and calculation of appropriate benchmarks (*ISSA Guidelines on Investment of Social Security Funds*, Guideline 14):
 - The performance and risk characteristics of fund assets as well as specific asset classes will be compared against appropriate benchmarks. The selection of these benchmarks is important, as their characteristics need to be consistent with the objectives of the investment process. The actuary may input into the decision of whether the benchmarks should be absolute or relative, nominal or real, or liability-related, as well as whether they should be a combination of market-weighted indices. The actuary will also provide a view on the quality of the benchmark. The determination of the benchmark return may require the involvement of the actuary, particularly if the benchmark is a combination of different indices or requires currency conversion.
- Other calculations related to asset performance (e.g. other risk analysis including currency hedging considerations, analysis of charges, passive versus active choices) (*ISSA Guidelines on Investment of Social Security Funds*, Guidelines 17, 21, 22):
 - The actuary may be involved in other investment areas. Calculations should be performed using an appropriate methodology and basis. For example, the implications of currency mismatches where assets may be in several currencies and liabilities in the home country currency are significant for institutions and will require an appropriate assessment. Working with other stakeholders (e.g. the risk function, investment managers, valuation actuary, auditors, etc.) is important and should be formalized. Decision-making processes and communication lines should be defined and respected.

Guideline 23. Input into the valuation of assets and benefit calculations

The social security institution involves the actuary in the processes which determine an appropriate value to place on the scheme's assets.

Placing an appropriate value on assets is important and may be required for a number of different reasons, including the need to assess the financial situation of a social security system and to determine benefit amounts.

In certain programmes, the value of benefits of current and/or future beneficiaries is directly or indirectly related to the value placed on assets.

The determination of assets value may also trigger the application of any automatic adjustment mechanism (see Guideline 19 on automatic adjustment mechanisms).

This guideline should be read in conjunction with Guideline 6 which covers issues related to the valuing of assets for valuation purposes.

Principles

- The responsibilities regarding those involved in the process of the valuation of assets should be defined and documented. A peer review and reporting process should also be put in place, monitored and reviewed regularly.
- The methodology and assumptions chosen in the valuation of assets should be discussed, justified, documented, and disclosed. The method may vary according to the aim of the valuation (e.g. assessing the sustainability of the programme, application of automatic adjustment mechanism, asset liability modelling, financial reporting, etc.). Valuations should be carried out in accordance with international and national standards and any relevant legislation.
- Actuarial input into the value placed on assets will also be required in defined contribution and provident fund schemes in respect of what credit to declare on individual accounts. In order to undertake these tasks effectively, it is important that appropriate valuation techniques are used and that an appreciation of risk and reserving requirements is incorporated into the analysis.

Mechanism

- The valuation of the assets requires collecting relevant information at the assessment or valuation date. This will require close coordination amongst the different stakeholders involved in the investment process (e.g. custodians, investment managers) both within and outside the organization. The data required will include information on assets held, income generated in the measurement period, price or value of assets at measurement date and any tax information.
- Mark to market (MTM, or fair value) accounting should be undertaken where possible to value assets. While market values are likely to be used for the value placed on the majority of assets, alternative approaches where there is no market or a market that is very illiquid will be required (e.g., infrastructure and private equity). Where the asset value is determined through a discounted cash flow approach, the assumptions, methodology and calculations

should be verified. Where neither approach is possible or deemed not appropriate, alternative approaches should be considered. In such a situation it is important that the assumptions and methodology underlying the calculations are set down and that a peer review process exists to verify the value placed on assets. Future valuations of assets should assess retrospectively the accuracy of alternative approaches used, if possible. External expertise may be required depending on the internal resources available within the social security institution.

- The actuary may be required to verify whether the values placed on the assets by another party are appropriate. It is important that the actuary liaises with other stakeholders to ensure this review and verification are properly carried out.
- In programmes where part or all of provision is provided by provident fund or defined contribution elements, actuarial input may be required to recommend rates of return to credit or assess the implications of crediting certain rates of return to individual accounts or entitlements. Guidelines 15 and 17 cover issues relating to the determination of returns credited to provident fund and defined contribution accounts respectively.
- The role of the actuary involved in the investment process will be to provide information regarding returns achieved on assets held (capital appreciation, income and dividends) as well as regarding liquidity issues and volatility of returns. Coordination and discussion regarding the credited amount to individual accounts is important, given the significant implications of such decisions on scheme adequacy and sustainability.
- In the case of provident funds and defined contribution schemes where returns credited are set down in regulations or legislation or are smoothed, there will be a difference between amounts credited and the return on underlying assets. In this situation it is important that the implications of this difference are analysed appropriately.
- The setting up of investment reserves requires actuarial analysis (for example, what proportion of excess return above a stated minimum needs to be reserved and what proportion can be credited to accounts). Appropriate methodology and assumptions should be used to input into this decision-making process as well as determining whether current reserves held are sufficient.

Guideline 24. Investment reporting

The actuary inputs into the investment reporting process to ensure that information disclosed is accurate and presented in an appropriate way. The actuary also provides input into the decision-making process in respect of what information to disclose.

With increasing scrutiny of social security institutions' investment practices, clear and understandable reporting is essential. This guideline should be read together with Part D of these Guidelines and the *Guidelines on Communication by Social Security Administrations*.

Principles

- The actuary should provide input into what information should be disclosed and in what form. Information provided should add to public understanding of how the social security institution manages assets.
- An actuary may be involved in the provision of information for the report. If this is the case, a proper peer review process is required to ensure the information is accurate, up to date and relevant.
- Investment information provided should be consistent with other communications provided by the social security institution, in particular any benefit statements provided to beneficiaries but also annual reports and information on benefit factors and projected benefits.

Mechanism

- The information disclosed may include:
 - Total value of assets split by asset class;
 - Changes in asset value over the year split by source of return;
 - Assessment of risk over the measurement period, split where possible by source of risk;
 - Performance (real and nominal) of each asset class over the year;
 - Income generated from assets during the year;
 - Expenses relating to investment management;
 - Valuation method and assumptions used (where relevant);
 - Returns credited to provident funds or defined contribution accounts where relevant;
 - Other information where appropriate.
- The actuary may advise what information should not be disclosed and for what reasons (for example, if the information is market-sensitive).
- The actuary should work with other stakeholders where appropriate.
- Where actuarial involvement in the investment process covers multiples aspects (e.g. costing of benefits, projected benefit calculations, supervision, etc.), it should be ensured that all relevant reporting is mutually consistent in nature, form, assumptions used and frequency.

D. Reporting, Communication and Disclosure

A well-defined reporting process is a vital element of good governance for social security schemes. Actuarial and financial reports based on sound data, assumptions and methodology contribute to the financial sustainability of schemes. Information presented in such reports can send “early warning signals” if a scheme is experiencing difficulties; it can identify short-term and long-term trends that have a potential to make the scheme unsustainable, and, as a result, trigger public and other stakeholder consultation regarding the sustainability of the scheme. Providing clear and accessible information also improves public confidence in a social security scheme and is likely to reinforce public and political support.

Communication through a formal reporting process as well as through other channels is an important component of actuarial work. The social security institution, together with the input of actuaries, should ensure a robust reporting and communication process with accurate, relevant and timely information. This part should be read in conjecture with the *ISSA Guidelines on Communication by Social Security Administrations*.

Guideline 25. Communication between board members, management and the actuary

The board (if any), management of the social security institution and the actuary communicate clearly and effectively. This exchange of information improves management but doesn't negatively impact the independence of the actuary.

Principles

- In the exchange of information there should be complete transparency between the board, management and actuary.
- The actuary should provide the board and management of the social security institution with regular updates (unless there are exceptional circumstances, not less frequently than annual) with regard to the financial situation of the social security schemes administered by the institution. These updates may be based on a full or updated actuarial valuation or other appropriate mechanism which seeks to provide a realistic indication of the financial situation of the schemes at the reporting date.
- While respecting the independence of the actuary, the board and management of the social security institution should be able to provide their input into all aspects of the actuarial work undertaken.

Mechanism

- The actuary should present to the board and management preliminary as well as final results of any actuarial valuation. Presentations should cover the main elements of the actuarial review: data, assumptions, results and recommendations.
- The board and management of the social security institution should be provided with the opportunity to review the results of the actuarial work (e.g. actuarial reviews) and provide their feedback to the actuary. The actuary should consider this feedback and explain whether it was or was not taken into account and why.
- The actuary may be asked to provide additional information to board members by explaining different aspects of actuarial work including technical details.
- The actuary should submit the report summarizing the results of the actuarial valuation to the board and management of the social security institution.
- The frequency of such updates should be at least the same as the frequency of the full actuarial valuation. Additional updates on a more frequent basis should be encouraged to improve management processes and may be required if supplementary actuarial valuations are performed (see Guideline 1), or the stakeholders require more frequent communication (e.g. annual).

Guideline 26. Reporting process considerations

The social security organization follows a well-defined reporting process with respect to the actuarial valuation of a social security scheme.

A legislated, well-established and well-defined reporting process is a vital part of the good governance procedures for social security programmes. This guideline should be read together with Guidelines 1 and 43.

Principles

- The social security institution should comply with Guideline 43 on sustainability considerations stating that the social security institution and actuary should follow legislative requirements in regard to the frequency of actuarial assessments of a social security scheme. In the absence of legislative requirements, the social security institution should establish and follow an internal policy on the frequency of actuarial reviews.
- The frequency of actuarial reviews should reflect the nature of the social security scheme under consideration. It may be appropriate for the social security institution to ensure that more frequent reviews are performed than those required by legislation. This may be appropriate, if, in the opinion of the actuary or/and the social security institution:
 - The legislative requirements with respect to the frequency of actuarial reviews are not consistent with the nature of a social security programme; and/or
 - Economic or demographic environmental changes in the intervaluation period are expected to have material impacts on the financial status of a social security scheme.
- The social security institution as well as the actuary should comply with legislative deadlines with respect to producing the results of an actuarial valuation and their communication to stakeholders. In the absence of legislative requirements, the social security institution should formulate an internal policy describing the key dates and deliverables for the main steps of the actuarial review, independent expert review and communication process.
- The provision of new or expanded benefits that may materially change the contribution rate should trigger a new or updated actuarial valuation to reflect the change and assess its impacts.

Mechanism

- Social security schemes providing pension benefits should be reviewed at least every five years. Where data and resources allow, and depending on the nature of scheme benefits and the financial size of liabilities, valuations should be carried out more frequently. Social security schemes such as health care, employment injury and unemployment insurance schemes should carry out actuarial reviews on an annual basis.
- A changing external environment may warrant more frequent reviews of social security schemes. Examples of such changes include economic recessions and financial market volatility resulting in significant decreases (or increases) in asset values.

- Major deadlines associated with the reporting process in regard to the actuarial review include, but are not limited to, the following:
 - The maximum time period after the effective date of the actuarial review by which the actuary should provide results of the review to management and/or board of the social security institution;
 - The maximum time period after the effective date of the actuarial review by which the social security institution should inform stakeholders and appropriate overseeing bodies of the results of the review;
 - The maximum time period after the completion of the actuarial review by which the independent expert review is conducted;
 - The maximum time period by which the actuary and/or the social security institution should act on recommendations of the actuarial and the independent expert reviews.

These deadlines should be defined either by legislation or by the internal policy of the social security institution. The social security institution should support the actuary in facilitating the timely delivery of results.

Guideline 27. The social security institution's responsibilities with respect to actuarial reporting and communication of changes in scheme's provisions

The social security institution provides stakeholders with regular, timely and comprehensive information on the actuarial status of the social security scheme. The social security institution informs stakeholders, in a timely manner, of any changes in the scheme's provisions and their impact on the sustainability of the scheme and adequacy of benefits.

The regular and timely communication of the findings and recommendations of the actuarial valuation to programme stakeholders and decision-makers is a crucial step in maintaining the sustainability of social security arrangements and ensuring that the scheme meets its objectives.

Principles

- The social security institution should communicate to policy-makers in a timely manner (as set out in Guideline 26) the results of the actuarial review of the social security scheme. The best approach is to submit reports to the legislative body of the country (e.g. Parliament) for a transparent discussion and to make the actuarial report publicly available.
- The social security institution should share the information regarding the actuarial review with the scheme's stakeholders including workers and their representatives, employers, pensioners, etc.
- The social security institution should develop and document a policy on communication with respect to the actuarial review and ensure that it is carried out in practice.
- Material changes to social security provisions such as contribution rate increases, changes in benefits or increases in eligibility age may be required over the long term. The actuary should conduct an actuarial valuation which determines the financial impacts of such changes. The results of such a valuation should be communicated to the stakeholders.
- The social security institution should inform stakeholders regarding possible changes well in advance of the effective date of such changes. This allows the population to understand the importance of future reforms and adjust behaviour, as well as providing for appropriate transition periods and sufficient time for supporting policy and administrative measures.

Mechanism

- The social security institution may submit actuarial reports to the appropriate minister for tabling with the legislative body. This process should be defined either by legislation or by an internal policy.
- The stakeholders should be informed about the release of the actuarial report as well as of the release of the report of an independent expert review. This may be accomplished through press releases, press conferences, social media, direct communication to stakeholders' associations, etc.
- The social security institution should communicate the findings of the actuarial report and of the external expert review to stakeholders. This may be accomplished through a combination of web and hard copy publications.

Guideline 28. Technical and non-technical communication of actuarial information

The social security institution communicates actuarial information in a way that is appropriate for the intended audience.

It is often difficult to communicate technical information to different stakeholders. These stakeholders include board members, parliamentarians and plan participants who will have different levels of skills, experience and expertise. The social security institution, with the assistance of actuaries, should work at preparing communications that address the needs of both technical and general audiences.

One particularly important area of actuarial involvement is the preparation of annual benefit statements sometimes provided to social security scheme participants. These should be accurate and provide comprehensive and clear information on a regular basis. Information should be determined using appropriate methodologies and assumptions. Since the annual statements often contain information of an actuarial nature, it is crucial for the actuary to be involved in the preparation of these statements.

This guideline should be read in conjunction with Guideline 9.

Principles

- The publication of results of actuarial reviews may be accompanied by a communication (e.g. a press release or an executive summary) that summarizes in lay terms the main findings of the review. The actuary should assist in preparing such communications.
- Annual statements of benefit entitlements should be based on the provisions of the laws and regulations governing the scheme and individual historical records of contributions, earnings and credited service, as well as other pertinent individual information.
- Annual statements of benefit entitlement should describe applicable scheme provisions and provide benefit entitlements at the main eligibility ages.
- The actuary should work together with communication and administration departments of the social security institution to ensure the accuracy of the calculations and of the communication.
- The independent expert review should address the quality of the communication as a result of the actuarial work (Guideline 11). The social security institution and the actuary should carefully consider and implement, if practical, recommendations of the independent expert review on communication (Guideline 12).

Mechanism

- Actuaries should be able to present results of their work to different types of audiences. The social security institution should ensure that the actuaries it employs have an opportunity to develop strong oral and written communication skills.
- When presenting results of actuarial reviews or discussing other actuarial matters with the board and management of the social security institution, as well as with other stakeholders, the actuary should ensure that the information is presented in a way that enables stakeholders to make informed decisions.

- The actuary and the social security institution may issue several communications on a particular subject aimed at different audiences. These should be internally consistent.
- The social security institution should set up a procedure to assist members in understanding the annual statement of benefits. The actuary may be asked to assist the communication and administration departments in answering members' questions and preparing explanatory materials.

E. Risk Management and Analysis

Although the role of social security is to respond effectively to life-cycle risks of the population covered, the management, financing, administration and delivery of benefits and services supporting this role are also subject to risk. The risks inherent in what social security institutions do are multifaceted, changing and often complex. The nature of risk depends on outside trends and factors as well as how the institution carries out and monitors tasks internally.

The management of risk enables an organization to increase the likelihood of achieving its objectives and this applies equally to social security institutions. Effective risk management requires the input and involvement of specialists with an understanding of the measurement and treatment of risk and the use of appropriate methods and assumptions to analyse risk. Actuarial input is therefore increasingly important in this area. At the same time, this part is also relevant for other professionals with risk management responsibilities.

While all risks arguably have a direct or indirect financial implication for the institution, the analysis and treatment of risk is often split into those impacting the financing and design of benefits (“scheme risks”) and that have direct financial implication for the scheme, and those impacting the management of the social security institution (“operational risks”) which have more indirect, or harder to quantify, financial implications. The risk function should ensure that the management of a number of individual risks remains consistent with the overall risk management principles and considerations at an institution, system- and scheme-wide level.

This part therefore addresses these different risk issues using the framework of a risk management process. Guideline 29 sets out this framework covering the key principles underlying risk management, including the setting up of a risk management plan and considerations around the risk budget or appetite of the social security institution. The risk management process consists of three elements: the identification of risk (Guideline 30), the measurement of risk (Guideline 31) and the treatment of risk including retention or transfer (Guideline 32). The practical application of the risk management process in treating scheme risks and operational risks is then set out in Guidelines 33 and 34 respectively.

Actuaries are professionals who have extensive expertise in identifying, measuring and managing risks by applying their skill and training in mathematics, statistics and risk theory and therefore should be involved in each step of the risk management process of the social security institution.

Guideline 29. Risk management framework

The social security institution establishes a risk function that oversees the management of risk and reports to the board, if any, and/or management. This function, and the processes carried out or overseen by it, require actuarial input. The risk function coordinates with other functions to ensure effective risk management.

Due to their understanding of risk issues, actuaries should be involved in the management of risk within a risk management function and/or involved in the risk management process. This may include contribution to a risk management plan and the setting of an appropriate risk budget and/or risk appetite for the social security institution.

The issue of risk is increasingly important for social security institutions due to the complexity of benefit provisions and financing, the risks inherent in the investment process, the use of information and communication technology (ICT), and reputational risk linked to the increasing scrutiny of what social security institutions do and how they do it. In addition, an understanding of potential changes in the external environment will also be required to ensure that appropriate analysis is undertaken today to anticipate the evolution of risks in the future. Many institutions have responded to this reality with the creation of specific risk management functions or departments facilitating the input of risk specialists, including actuaries, in this area.

The management of risk enables the social security institution to increase the likelihood of achieving its objectives. However, managing risk is not simply a passive exercise where the institution responds to the risks it faces; it requires the setting up of a project management cycle to define the risk appetite and risk budget of the institution, assess the risks faced by the institution now and in the future and make the most appropriate decision on the treatment of risk.

An effective governance structure is an important element of risk management. It should ensure that sufficient information on risks is collected and managed and that appropriate structures and mechanisms are put into place to address them.

Actuarial involvement in risk management touches on many aspects of social security institutional practice. Other individual guidelines in this document refer to risk issues in different areas such as investment, financing and benefit design. These specific considerations will feed into the overall risk management considerations and process set out in this part.

Social security seeks to respond to the life-cycle risks of the population it covers. These risks include death, disability, illness, unemployment, retirement, changes in family structure, and health-care cost changes. While the design and delivery of benefits seeks to respond to these population risks appropriately, by taking on these responsibilities the institution itself becomes responsible for managing certain risks. The assessment and treatment of risk seeks to ensure that the risks the institution takes on are understood and assessed, but also that due consideration is given to the transfer and sharing of risk and the reduction of risk that is retained. Effective risk management seeks to ensure an appropriate split between the transfer, reduction and retention of risk.

Principles

- The management of risk affects a number of different areas of operation and should be overseen by a risk function reporting to the board and/or management. The role of this risk function is to set up and manage the risk management framework and process. Integral to this process is the design, implementation and monitoring of a risk management plan.
- The role of different stakeholders involved directly or indirectly in the risk management process should be identified. The expertise and experience of these stakeholders should feed into the risk management process. This can be done through effective coordination between stakeholders, but will require clear and monitored structures and processes. The risk function should manage this process.
- The key element of risk management is the identification, measurement and treatment of risk (Guidelines 30–32). However, an effective management process requires that an analysis of appropriate risk appetite or risk budget is undertaken and reviewed regularly. The risk budget depends on a number of factors which will vary by institution, but include the objectives of the system, the benefit aims, design and financing, the management capacities and governance budget as well as an appreciation of external factors. The term “risk/return trade-off”, although more typically used for investment risk considerations, expresses the concept that risk should be rewarded and that reducing risk has a potential cost to the system.
- Once a risk budget has been set, one of the most important financial decisions for the institution is whether to directly assume or transfer this risk, and how to accomplish the decision taken. For a risk that is retained, the risk function responsibilities include making sure that each risk has an owner and that the risk owners are taking the appropriate actions to quantify and manage their risks, including putting in place appropriate risk mitigation. The risk function should monitor and review this process, including setting out the guidelines for decision-making (e.g. materiality limits), and should report to senior management or the board on how each risk is being managed and who is responsible for managing it. Social security institutions are particularly relied on, and expected, to retain many types of risk so that any decision to transfer risk to other parties (e.g. employers, employees, individuals) must be carefully considered.
- The risk management process should be properly documented (including objectives, personnel involved, instruments used, results and monitoring) and reviewed on a regular basis. The required competencies of those involved in the process should be defined and gaps in knowledge and experience identified and addressed. Outside expertise should be sought if required (e.g. if expertise does not exist within the institution).

Mechanism

- The management or treatment of risk, once identified and quantified, includes removal or reduction of the risk, mitigation of the impact of the risk, and a choice between transfer and retention of the risk. The risk management process seeks to identify the most appropriate mix of these three options, which will depend on:
 - The nature of the benefits and financing method;
 - Risk retention and management capacities within the organization;

- The covered population;
- The risk transfer mechanisms available.
- A risk management process allows those responsible for risk management to undertake this procedure effectively and efficiently. The social security institution should document this process through a risk management plan which details the institution’s attitude to risk (e.g. risk budget), responsibilities and methods for identification and monitoring of risk and the key principles underlying decisions regarding the treatment of risk.
- The actuary, with his or her knowledge of risk and its treatment as well as an understanding of the many processes of the institution where risk is important (e.g. investment, operational risk, benefit payments, etc.) should be solicited for input into the process. It is important that correct analysis is used to assess risk and that actuaries liaise closely with other stakeholders regarding its management.
- The actuary and institution should refer to international risk management standards where these are relevant. These standards cover the principles, definitions, principles and processes surrounding risk management. The supporting material to these Guidelines sets out more details of risk management standards that may be relevant.
- The risk management framework requires that risk is identified, analysed and treated. At a system-wide level, overall risk should be mitigated through the different mechanisms available to the institution. The risk management framework should be defined and constantly assessed.

Risk management framework



Guideline 30. Identification of risk

The social security institution sets out appropriate processes and structures to identify risk.

The first element of the risk management process is the identification of risk. There are two main types of risks faced by the institution: scheme-related risks with typically direct financial implications (covered in Guideline 33), and operational risks with typically indirect financial implications (covered in Guideline 34). The identification of all risks requires a review and assessment of all the activities of the social security institution, including the design, delivery, financing and funding, management, administration, and communication of benefits and services. This process should provide information to the institution regarding which risks exist, their importance and their likely evolution in the future.

Principles

- The risk function should manage the process of securing information on the different risks facing the social security institution.
- The actuary is likely to play a key role in this process in two ways: through the identification of the different risks faced by the institution and through providing data on certain risks.
- A database of risks or risk inventory should be maintained by the institution and its operation and maintenance reviewed on a regular basis. Communication of risks by different stakeholders (e.g. the investment function, administrators, actuaries, etc.) should be encouraged and facilitated as a part of this process.

Mechanism

- The actuary may provide specific input into the identification of different risks. The actuarial valuation and asset liability management processes provide useful information on the nature of certain risks. In addition, actuarial input is likely to be required in other areas where actuaries have developed expertise, such as an understanding of the nature of benefit payments and an analysis of external trends impacting liabilities (e.g. changes in legislation, mortality experience development).
- Other sources of information on risk which directly or indirectly involve actuaries may include input from auditors and independent audits or assurance reviews, cash flow controls and input from other stakeholders, inputs from professional advisors (e.g. external investment managers or external actuaries) and external experts who may be commissioned to analyse risk within the organization. The actuary should work closely with other professionals and ensure communication and reporting are clear.

Guideline 31. Measurement of risk

The social security institution sets out appropriate processes and structures to measure risk.

The measurement of risk consists of assessing the frequency and severity of the risks identified as well as the likely distribution of outcomes. The frequency of a risk is the probability the event will occur; the severity is the financial implication; while the distribution refers to how widely outcomes are likely to vary from the mean expected event.

Principles

- Actuarial input should be solicited for the task of measurement of risk. The process requires good information on the risk (Guidelines 30, 33 and 34) and other supporting information which will assist in an assessment and measurement of the risk. In some situations information regarding frequency and severity of risk will be available and detailed (e.g. investment risk), while in other situations the analysis will be more subjective (e.g. reputational risk) and rely on the experience and expertise of those involved in the process, including the actuary.
- The area within the social security institution responsible for risk management (e.g. the risk function) should define the roles and responsibilities of different stakeholders, including actuaries, involved in the process. This includes the peer review process.
- Risk should be assessed and monitored on a regular basis. The process by which this is carried out should be defined and monitored. Relevant reporting procedures assist in the management of risk. The risk function should provide input into which risk measures and reporting should be provided by other functions and departments in the institution, to ensure consistency of methods and reporting format.

Mechanism

- The measurement of risk should be carried out using appropriate methodology and assumptions. There should be a proper peer review process to monitor how the risk has been assessed. Previous assessments of risk should be revisited, as they provide useful information about the risk management process.
- The likelihood of an event occurring should be assessed based on the professional expertise of risk owners and other relevant parties, including the risk management function. This assessment should take into account past events and the likely evolution of the internal and external environments in the future. Discussion with those involved in different functions of the institution should be undertaken.
- The measure of the severity of risk should be based on the expected financial implication of an event. Though the assessment of the severity will vary by type of risk, the methodology and assumptions used should be detailed for risks which are material. Past experience may be useful in providing a guide to likely outcomes; however, the actuary should incorporate a forward-looking approach in the calculation to reflect changes in the external and internal environment. For some events (e.g. political) and risks (e.g. operational), assessing the financial implication is less straightforward, and other qualitative metrics should also be considered. The sources of information to assess risks include those identified in Guidelines 33 and 34. In

particular, the actuarial valuation may provide useful information in the determination of the risk (e.g. Guidelines 7 and 8).

- The assessment of the distribution of risk is important, as it is notably the extreme events at both ends of the distribution that may have the most impact on the social security institution. At the same time, a large accumulation of low severity risks can also be challenging, with potentially significant financial implications. The distribution of outcomes should be considered by assessing the distribution of both frequency and severity, as well as the correlation between risks. The reporting of outcomes will probably seek to look at a limited number of scenarios (e.g. central, optimistic, pessimistic and extreme).

Guideline 32. Mitigation of risk

Once risk has been identified and measured, the social security institution makes appropriate decisions regarding the mitigation and treatment of risk.

This guideline covers how the social security institution treats risks. Even though certain areas of operation of the social security institution and/or social security scheme may accept higher risk when this is rewarded, this decision should be made in the context of reducing overall system risk or risk to society. Therefore, the treatment of different risks, including the possible reduction of risk and the choice between retaining and transferring remaining risk, should be undertaken in the context of an overall risk mitigation objective.

Principles

- It is important to distinguish between the different types of risk when deciding on what (element of) risk to retain and what to transfer. Social security schemes exist to provide benefits and services to respond to life-cycle risk, and therefore act as takers of risk for, and from, the population covered. By accepting the responsibility for management, financing and delivery of social security benefit, the social security institution itself becomes exposed to certain risks. The choice regarding retention or transfer of risk requires an assessment of the cost and benefits to society of either approach, and a judgement on the most appropriate balance. This is particularly true in the case of investment risk but also in other areas of activity, for example operational risk, where a choice will be made depending on resources available within the institution as well as on external options and their cost. Reference to the risk budget in these decisions is essential.
- A social security institution needs to be rewarded sufficiently for taking certain risks. If this reward is not adequate, then a reduction or transfer of risk should be sought. The reduction of risk may be straightforward, but in most situations it comes at a cost (e.g. lower expected investment returns). The actuary should continually assess this likely cost. However, the trade-off is unlikely to be simple to determine in many areas of operation, and decisions will be based on considerations involving many areas of operation of the institution (benefit design, financing, communication, investment, etc.). Therefore, it is important that a holistic view is taken when decisions are made.

Mechanism

- Risk may be reduced through primary or preventive measures (measures taken to reduce the frequency of risk, for example, healthy eating initiatives), and secondary measures which focus on reducing the severity of impact of the event, for example, return-to-work measures for those receiving disability benefit. Secondary measures seek to reduce both the mean outcome and the distribution or variation of outcomes. The actuary should provide input into the possibilities and implications of both approaches.
- Once risk has been mitigated, decisions regarding further treatment will depend on the desired and possible allocation between retained risk and transferred risk. The actuary should take into account any legislation or other constraints which limit the scope of such decisions, as well as

the risk transfer mechanisms available. When the risk function makes the decision to retain or transfer risk, actuaries should consider the:

- Predictability of risks;
 - Ability of the covered population to take on risk;
 - Size of the covered population over which the risk can be spread;
 - Cost of transferring risks;
 - Absolute levels of risk;
 - Availability of suitable risk transfer processes and their cost for both the social security institution and the covered population;
 - Ability to manage and/or control risk within the organization.
- The retained remaining risk should be managed and further mitigated, where appropriate, on a continuous basis. The financial implication of the retention of risk should be assessed and monitored on a regular basis. An inventory of retained risk should be maintained and updated as appropriate. A regular review and escalation process for the risk register should be established.
 - The transfer of risk will depend on the factors referred to above. The actuary is likely to provide input into the decisions regarding how to transfer risks and the costs involved, as well as the process of selecting the appropriate transfer mechanisms and external providers. The actuary will work closely with other professionals involved in the process.

Guideline 33. Actuarial input into the management of scheme risks

The social security institution seeks actuarial input into the management of risks faced by social security schemes.

This guideline identifies some of the risks related to social security schemes, sets out the mechanisms to consider in addressing them through their identification, measurement and treatment using the risk management process set out in Guidelines 30, 31 and 32, and describes actuarial input into this process.

Principles

- The role of the actuary and the risk management function should be to analyse the multiple risks faced by social security schemes in the context of the risk management process or framework.
- This role should be defined and continually reviewed in collaboration with other stakeholders involved in the risk management process as well as the board and management of the social security institution.

Mechanism

- The risk management function and the actuary should identify the risks faced by the social security scheme. These are likely to include, but are not limited to, the following (it should be noted that several risks described below are interrelated):

Benefit expenditure risk

- The benefit expenditure risk is the possibility that benefit amounts paid will be greater than expected. The reasons this may happen include differences between actual and expected benefit payments due to external factors, and changes in benefit rules (e.g. leading to higher payments than expected), as well as higher than anticipated administrative expenses.
- Differences between actual and expected benefit payments may be triggered by the following factors:
 - Mortality experience different from expected (e.g. lower than expected mortality for retirement systems);
 - Morbidity experience different from expected (e.g. for disability benefits and health schemes);
 - Other demographic factors different from expected (e.g. marriage rates, number of children);
 - Increases in salaries greater than expected (in schemes where benefits depend on the individual's salary);
 - Inflation greater than expected (where benefit levels depend on the inflation rate);
 - Unemployment higher than expected (for unemployment schemes);
 - Health care reimbursement to providers higher than expected.
- While changes in benefit rules usually are driven by legislative changes and are phased in, more rapid changes caused by extreme events which lead to, for example, sharp jumps in unemployment or disability cases may also occur. These changes may include ad-hoc payments not envisaged in the benefit rules (e.g. increases to pension in payment). There is also political risk related to reform measures in particular and scheme benefits in general; a change in

government or unforeseen changes in policies can have immediate impacts on benefit design and financing mechanisms.

- Administrative expenses may be influenced adversely by changes in benefits, new legislative requirements as well as by administrative inefficiencies causing cost overruns. Further operational risks described in Guideline 34 may result in higher than projected administrative expenses.
- Other factors impacting benefit expenditure risk may depend on the evolution of external environments (e.g. increasing unemployment or high inflation) and should be monitored as part of the risk management process.
- Information on benefit expenditure risk can be secured from the actuarial valuation and cash flow analysis. The measurement of this risk should consider an analysis of experience from past valuations as well as accompanying reconciliations and sensitivity analysis as described in Guidelines 7 and 8. It should be ensured that this information is based on relevant mortality and morbidity tables and appropriate other assumptions (Guideline 3).
- Treatment of risk should consider changes in benefit design, changes in investment strategy, preventive measures (e.g. reduction in workforce disability cases, partial unemployment schemes), and improving administrative efficiency as well as increasing involvement of all stakeholders.
- It is important to note that what would appear to be a reduction in expenditure risk through reducing benefits creates or increases other risks related to inadequate benefits (see Scheme objectives risk below).
- Reference should also be made to Part B and Part G of these Guidelines which cover issues relating to benefit design and financing, and calculation of actuarial factors and benefit entitlements. For example, information in Guideline 19 relating to automatic adjustment mechanisms, and Guidelines 15 to 17 on returns credited to accounts, can be considered as measures that can be or are taken to treat risk.

Financing risk

- Financing risk relates to the possibility of having insufficient financial resources to meet obligations. This may result from lower employer and employee contribution income than expected, reduced government financial transfers or lower income from assets than expected. This risk is extremely important since it could lead to financial and intergenerational unsustainability of the scheme and major schemes changes. These changes could include changes in benefits and contribution levels as well as financing approaches.
- Guidelines 40 to 43 and 46 provide additional information regarding the treatment of this risk. Similarly Part B may also provide information on measures to take to mitigate and treat such risk.
- Actuaries should assist in identifying, measuring and treating this risk through the analyses undertaken as part of the actuarial valuations, actuarial studies and asset liability management, as well as through provision of expert advice. Guidelines in Part A and Part C set out more information on the financing risks.

Investment risk

- This risk relates to all aspects of the investment process, including specific risks relating to assets held, income and capital appreciation being less than expected, investment matching risks, third-party risk, volatility risk and default risk. Guidelines 20 to 23 as well as the *ISSA Guidelines on Investment of Social Security Funds* provide additional information on this risk.

Interest rate risk

- Interest rate risk will particularly impact on actuarial deliberations in Part A (values placed on assets and liabilities) and Part B (calculation of factors and benefit entitlements) of these Guidelines.

Currency risk

- This risk relates to a potential mismatch between the currency in which the liabilities of the social security system (typically the currency of the home country) are denominated and the currency in which some of the assets of the reserve fund are held. Guidelines 21 and 22 provide additional information on this risk and its measurement and treatment.

Third-party provider risk

- This risk concerns external providers (e.g. custodians, health administrations, auditors). Guideline 48 covers a number of the issues to consider in the appointment of external actuaries. The *ISSA Guidelines on Investment of Social Security Funds* also provide supporting advice on issues relating to the appointment and monitoring of a range of external providers, including investment managers and custodians.

Scheme objectives risk

- Scheme objectives risk is an important risk related to the social security system not meeting its objective to appropriately respond to life-cycle risks. This risk can include inadequate coverage of the population; providing benefits that are not adequate; or the provision of inappropriate benefits (benefits and services provided which do not meet the needs of the individual, the household or society as a whole leading to a sub-optimal use of resources and the system not meeting its objectives). This may arise where the incentives created are inappropriate (e.g. not facilitating return to work of the individual) or do not support wider aims of systems (e.g. labour force participation rates at older ages). In such situations, the risk related to the person covered is transferred out of the social security system to either the individual or another party through formal or informal supporting mechanisms. It is therefore important that the implications of other risk decisions taken on scheme objectives risk are considered. More details of issues relating to coverage and benefit adequacy are set out in Guidelines 44 and 45.
- The risk of not meeting the system objectives also arises from operational reasons (see Guideline 34).

Guideline 34. Actuarial input into the management of operational risks faced by the social security institution

Actuaries are solicited in the assessment of some or all of the operational risks faced by social security institutions due to their knowledge of various elements of the management of a system. The internal actuarial department also conducts its own risk assessment which will feed into the overall risk assessment of the organization.

Social security institutions are faced with a range of operational risks related to the management, administration, communication and coordination of benefits and services. Although these activities are not directly related to the financing and design of benefits they may be the source of an important element of risk. These risks are likely to have both direct quantitative and indirect qualitative implications which may be difficult to assess. A number of the risks relate to governance aspects and this guideline should be read in conjunction with the *ISSA Guidelines on Good Governance*.

Principles

- The role of the actuary and the risk management function should be to analyse the multiple operational risks faced by social security institutions in the context of the risk management process or framework.

Mechanism

Some of the risks that should be considered under the framework of the operational risk management process are:

- **Human resources risk.** This is related to the risk of losing competent staff, failure to attract appropriate staff, being understaffed for the volume of activity, inadequate training, no succession plan and workplace-related risk (e.g. stress). Part H of these Guidelines provides supporting information on the management of these risks within the actuarial department.
- **Governance risk.** This relates to the risks arising from poor governance within the institution and may lead to inefficiency in carrying out processes, reputational issues, lack of monitoring of external providers, conflicts of interest, etc. Governance covers a range of different processes and procedures, including reporting (Part D of these Guidelines), peer review processes (Part A), skills and experience of personnel (Part H), meeting professional standards and compliance issues (Part F), and carrying out calculations correctly (Part B). The *ISSA Guidelines on Good Governance* provide an in-depth generic review of different processes and should be referred to. The *ISSA Guidelines on Investment of Social Security Funds* provide additional information on investment governance.
- **Regulatory risk.** This refers to not meeting the legislative requirements relating to the system and may include investing in assets which are proscribed, not meeting minimum service delivery targets or providing necessary information to beneficiaries, and failure to comply with legislated reporting requirements. A number of these risks relate to scheme-related risks but also are part of broader governance risk assessment. Part F provides detailed information on regulatory risks as well as compliance with professional standards, and Part D describes requirements regarding proper communication, reporting and disclosure.

- **Reputational risk.** This risk includes events that lead to a negative impact on the reputation of the institution and may include failure to pay benefits, a delay in paying benefits, poor service quality, errors in benefits calculations, potential conflicts of interest, etc. Reputational risk may have an important financial impact on the organization. Independent expert review and operational controls, described in Guidelines 10 and 11, could be indicators as well as sources of mitigation of this risk with respect to actuarial work. Guidelines 13, 51 and 25 to 28 also provide supporting information related to the management of this risk. It should be noted that one source of reputational risk is the provision of inadequate or inappropriate benefits and services (referred to in Guideline 33).
- **Operational risk.** This includes risk relating to the day-to-day operation of the social security system, for example ICT-related risk (such as inadequate testing of new systems and software), contribution collection, record keeping and business continuity. Operational risk can be linked to catastrophe risk since a flood, hurricane or tsunami can cause the loss of buildings or facilities (hospitals, clinics, etc.). This risk is directly related to the scheme objectives and financing risks set out in Guideline 33 and can include:
 - poor communication and information provision (leading to the possibility of claims for compensation and adverse judgements by ombudsmen);
 - problems with contribution collection (jeopardizing financing of the scheme and reducing effective coverage rates);
 - lack of a disaster recovery plan; and
 - inadequate record keeping and complex claims procedures (reducing effective coverage rates).

The ISSA Guidelines on Information and Communication Technology and ISSA Guidelines on Contribution Collection and Compliance assist social security institutions in mitigation of this risk. In respect of actuarial involvement, reference should in particular be made to Guidelines 2, 27, 28 and 50, as well as Part B of these Guidelines.

F. Regulatory Issues, Standards and Professional Guidance

The actuary should comply with national regulatory requirements, national and international actuarial standards, and national and, where applicable, international relevant professional guidance. Social security institutions should ensure that there is support for the actuary in this respect. Other professionals involved in actuarial work should also ensure compliance with relevant professional standards and guidance. Actuaries should use relevant methodology and assumptions to ensure that the social security institution complies with the relevant national and/or international accounting standards. In the case of conflicting regulatory requirements, national standards and/or international standards, the social security institution with the assistance of the actuary should develop a clear policy on the relative importance and application of the different sources of guidance, standards and/or regulations. Such policy may vary depending on the nature and purpose of actuarial work to be performed.

Guideline 35. Compliance with regulatory requirements

The actuary and social security institution comply with national regulatory requirements established by the state and/or supervisory authorities. These regulations have an impact on a number of different areas of the social security institution such as management, financing and delivery of benefits. The social security institution with the assistance of the actuary assesses if the national laws and regulations of a country comply with ratified ILO Conventions and informs the national government of any divergence from the ILO Conventions.

Principles

- The regulatory requirements include those at the national as well as international level.
- The actuary should be aware of national as well as international regulatory requirements affecting his or her area of work.
- The social security institution and the actuary should pay due attention to amendments and changes in national as well as international regulatory requirements and set up processes to monitor these changes.
- The actuary should assess, to the extent possible given his or her professional responsibilities, whether the social security institution complies with the relevant regulatory requirements.
- International labour standards are legal instruments adopted by the International Labour Conference composed of tripartite delegations including governments, employers and workers. These standards set out basic principles and rights at work and regulate other areas of the world of work. Countries are legally bound by ILO Conventions once they have been ratified. Recommendations serve as non-binding guidelines. In many cases, a Convention lays down basic principles to be implemented by ILO member countries once ratified, while related Recommendations supplement the Convention by providing more detailed guidelines on how it could be applied. Recommendations can also be autonomous, i.e. not linked to any Convention, such as the Recommendation concerning National Floors of Social Protection, 2012 (No. 202).

Mechanism

- Regulations may include those describing methodology and assumptions to use in actuarial valuations and benefit calculations, reporting regulations, investment regulations, regulations governing risk, etc.
- The social security institution should ensure that the actuary is regularly updated on changes in national as well as international regulatory requirements related to the schemes to which he or she provides input.
- The actuary, to the extent possible given his or her professional responsibilities and experience, should provide recommendations on improvements to laws and regulations. This may be particularly relevant where regulations and laws are contrary to the stated aims of the social security institution (e.g. regarding adequacy of benefits, sustainability of the system, etc.). In this regard, the actuary should have protection from legal liability.

- *Ceteris paribus*, the actuary should use assumptions in actuarial valuations in accordance with regulatory requirements. In case there is a conflict between regulatory requirements and actuarial standards, accounting or other professional standards and/or guidelines, the actuary should disclose the nature of the conflict and assess and indicate the resulting financial impacts and other implications (e.g. risk, administrative).
- The actuary should assist the social security institution in the assessment of its compliance with ILO Conventions ratified by the country and, as necessary, make recommendations on what actions the country and/or the social security institution could take in order to align the national legislation with the ratified Conventions.

Guideline 36. Compliance with actuarial standards

The actuary follows the relevant actuarial standards applicable in the country in which he or she works or those set by the actuarial association(s) of which he or she is a member. If the actuary is a member of an actuarial association which has not set relevant standards, the social security institution ensures that the actuary follows the International Standards of Actuarial Practice (ISAP) recommended by the International Actuarial Association (IAA) as model standards.

The purpose of actuarial standards is that intended users of actuarial work can have confidence that actuarial services are carried out professionally with due care, and produce comprehensive and understandable results relevant to users' needs. The IAA publishes the International Standards of Actuarial Practice (ISAP) to provide model standards for its members associations to adopt or adapt, or to use as a guide for preparing consistent standards. ISAP also provide guidance to actuaries when actuarial associations have not produced their own standards.

Other standards and requirements in fields related to actuarial work such as financial and statistical reporting, accounting and legal standards should also be taken into account by actuaries, as described in Guidelines 37 and 39.

Principles

- An actuary should ensure that he or she is familiar with relevant actuarial association and international actuarial standards affecting his or her work.
- The social security institution should ensure that actuaries perform their work in compliance with applicable actuarial association standards and, where no relevant standards have been set by their association, have regard to international actuarial standards, in particular ISAP 1 and ISAP 2 in the context of social security programmes.
- Compliance with actuarial standards enhances public and other stakeholders' trust in the credibility and competence of actuarial work, reinforcing the fact that the profession serves the public in an effective and responsible way.

Mechanism

- An actuary should take into account in his or her work any applicable standards of practice of his or her own actuarial association, and/or standards set by the actuarial association in the country in which the work is to be carried out, in order to ensure the quality and relevance of the actuarial work he or she performs.
- If there are no relevant actuarial standards set by his or her association and/or by the actuarial association in the country in which the work is to be carried out, an actuary should consider following any relevant international standards. The actuary should seek advice from his or her actuarial association and from the IAA if in doubt regarding the appropriate standard to follow.
- If an actuary finds that, in his or her opinion, another actuary does not fully comply with the applicable actuarial standards in their work on social security, he or she shall discuss with that actuary to clarify the areas of divergence and advise changes to be made in order to fully comply with the actuarial standards. In case the divergences are not corrected despite his or her advice, the actuary should report the issue to the social security institution. In such

a situation, the actuary should also refer to any reporting, whistle-blowing or disciplinary procedures set up by relevant actuarial associations.

- A social security professional who does not belong to an actuarial association and is involved in providing actuarial services to social security institutions should follow applicable actuarial standards, as well the code of conduct established by any national association or, in the absence of such an association, the minimum code of conduct required by the IAA of its full member associations.
- The social security institution should establish procedures to ensure that relevant actuarial standards as well as codes of conduct are followed with respect to the actuarial work for social security.
- The report on the actuarial valuation should specify the compliance with relevant actuarial standards.

Guideline 37. Compliance with accounting standards

The actuary assists the social security scheme in complying with the relevant accounting standards. The actuary uses the relevant methodology and assumptions when carrying out calculations to be used for accounting purposes.

Principles

- Social security institutions complying with national and/or international accounting standards should seek the input of the actuary to provide relevant input into the disclosures.
- The actuary should be aware of the relevant accounting principles, national statutory requirements and applicable guidance to be taken into account in performing his or her work.
- Accounting standards refer to technical documents and may change over time. The actuary should ensure that he or she understands the actuarial implications of the relevant standard and discloses them as appropriate.
- National actuarial standards usually provide guidance to actuaries and other professionals on compliance with accounting standards.
- Unless otherwise prescribed by applicable accounting standards, the methodology used in the actuarial valuation for accounting purposes should be consistent with the financing approach adopted for the social security scheme.
- When the methodology prescribed by accounting standards is not consistent with the financing approach of the social security scheme, the social security institution should encourage the relevant national authorities to disclose calculations consistent with the financing approach of the social security scheme, together with explanations on the different purposes of different sets of results and a discussion on long-term sustainability.
- An actuary is responsible for applying and respecting appropriate standards of practice in his or her work.

Mechanism

- Unless otherwise prescribed by the applicable accounting standard, for schemes financed using PAYG or a partial funding approach, the calculations of liabilities and assets should take into account future contributions as well as future benefits of current and future contributors. When prescribed accounting methods require an actuarial methodology that does not reflect the financing approach of the scheme, a separate disclosure of the results using the methodology consistent with the scheme's financing approach is recommended in addition to the results based on the prescribed method under accounting standards.
- An actuary should set out the details of the methodology and assumptions in the actuarial valuation report for accounting purposes and provide additional results where appropriate to ensure full knowledge is provided for policy-makers to obtain a fair and complete picture of the financial status of the scheme.
- It is recommended that the actuary presents sensitivity analysis results that illustrate how the required disclosed information is impacted by the use of alternative assumptions. Guideline 8 provides more details on illustrating uncertainty of results.

- The actuary should liaise appropriately with the scheme accountants and auditors in respect of the purposes and methodologies of accrual accounting, financial accounting, deficit calculations and other relevant accounting issues. These methods must be defined and explained in the actuarial valuation report for accounting purposes. The financial statements and other relevant figures should be consistent with the corresponding accounting standards.
- The report on the actuarial valuation for accounting purposes should specify compliance with relevant actuarial and accounting standards.
- The actuary should coordinate as appropriate with other stakeholders involved in the process with a view to ensure that the communication of results takes into account the financing approach of the scheme.

Guideline 38. Compliance with requirements of national and international statistical reporting

The actuary, on behalf of the social security scheme, assists national authorities in complying with the national and international statistical reporting standards. When carrying out calculations required for the purpose of compiling national accounts, government financial statistics and/or any other national and international statistical reports, the actuary uses relevant methodology and assumptions.

Principles

- The social security institution may be asked by national authorities, including the national statistical office, ministry of finance, ministry of planning and other relevant ministries, to provide information on social security schemes that comply with the national and international statistical reporting standards, such as the United Nations System of National Accounts (SNA) and government finance statistics. In such situations, the input of the actuary should be sought for preparing the calculations and providing disclosures in respect of the social security scheme(s).
- The actuary should be aware of the reporting principles, requirements and methodologies of national accounts and government financial statistics, as well as other national and international statistical reporting standards in performing his or her work.
- Unless otherwise prescribed by statistical reporting standards, the methodology and assumptions for preparing inputs for national accounts and government statistical reporting must be consistent with those adopted for the actuarial valuation of the social security scheme and with the financing approach adopted for the social security scheme.
- When the methodology for preparing inputs for national accounts and government statistical reporting is not consistent with the financing approach adopted for the social security scheme, the social security institution should encourage relevant national authorities to disclose, in a supplementary note, alternative calculations consistent with the financing approach for the social security scheme, together with explanations on the different purposes of different sets of results and a discussion on long-term sustainability.
- An actuary is responsible for applying and respecting appropriate actuarial standards of practice in his or her work.

Mechanism

- Unless otherwise prescribed by the requirements of national and international statistical reporting, for schemes financed using PAYG or a partial funding approach, the calculations of liabilities and assets should take into account future contributions as well as future benefits of current and future contributors. When national and international statistical reporting standards require an actuarial methodology that does not reflect the financing approach of the scheme, a separate disclosure of the results using the methodology consistent with the scheme's financing approach is recommended in addition to the results based on the prescribed method under the applicable requirements of national and international statistical reporting.

- An actuary should set out the details of the methodology and assumptions in the actuarial valuation report for national and international statistical reporting purposes and provide additional results where appropriate to ensure full information is provided to policy makers enabling them to obtain a fair and complete picture of the financial sustainability of the scheme.
- It is recommended that the actuary presents sensitivity analysis results that illustrate how the required disclosed information is impacted by the use of alternative assumptions. Guideline 8 provides more details on illustrating uncertainty of results.
- The actuary should liaise with relevant national authorities as well as other stakeholders in respect of the purposes, methodologies and disclosures of assets and liabilities in government statistical reports. These methods must be defined and explained in the actuarial valuation report for national and international statistical reporting purposes.
- The report on the actuarial valuation for national and international statistical reporting purposes should specify compliance with relevant actuarial and statistical standards.
- In communicating the results, the actuary should explain the differences between the requirements of national and international statistical reporting and the information presented in the actuarial valuation for assessing financial sustainability of the social security scheme.

Guideline 39. Other professional standards and guidance

The actuary complies with professional standards of any professional organization of which he or she is a member. The actuary complies with internal standards and guidelines of the social security institution, and/or institution to which he or she provides services. The actuary also follows any other guidelines relevant to the work which he or she is performing.

There exist several professional standards and guidance related to general professional behaviour, training, discipline issues and actuarial practice. Professional standards other than actuarial and accounting standards (e.g. professional standards for chartered financial analysts or risk specialists) have to be taken into account by actuaries because they can directly and indirectly affect their work.

At the international level, ISSA Guidelines and handbooks, the joint ISSA and ILO Quantitative Methods in Social Protection Series and ILO policy papers and internal guidelines provide international guidance on actuarial issues.

This guideline should be read together with Guidelines 49 and 51.

Principles

- Professional standards should aim to strengthen public trust in professional work.
- Professional standards should offer evidence of appropriate professional performance, constituting a basis for resolving any civil or professional conflict.
- Standards of practice should further assure regulatory authorities that they can depend on the actuarial profession to act effectively in the public interest.
- Professional standards can and should serve as standards and recommendations regarding continuing training for professional development.
- Professional standards should establish the role of actuaries with respect to their work for social security institutions on policy decisions that could affect the well-being of the population as well as the financial sustainability of social security schemes.
- Standards of practice coupled with provisions for disciplining members should show that the profession effectively governs itself and takes an active interest in protecting the public.
- Professional standards should provide guidance and recommendations on how to resolve possible conflicts where there are different standards, for example where accounting and actuarial standards refer to different methodologies and/or approaches.
- International guidelines and model standards, although they are not compulsorily followed until adopted nationally, should aim to provide guidance to actuaries.

Mechanism

- Actuaries should comply with the continuing professional development requirements established by the international and/or national actuarial regulations in order to maintain and improve the quality of their work.
- The actuary should be aware of his or her role in respect of any work for social security institutions on policy decisions.

- Social security institutions should be aware of the disciplinary measures which may be triggered when professional standards or compliance with national legislation are not respected. The actuary should immediately inform the supervisory authority, where applicable, when he or she observes irregularities in respect of professional standards and/or legislation in the management of a social security scheme.
- Actuaries should rely on professional standards and other guidance to resolve possible conflicts between different standards (e.g. between accounting and actuarial standards) in their methodologies and/or approaches.

G. Policy and Strategy Issues

Actuaries play a key role in the design, implementation and operation of social security schemes. Their expertise is an important contribution to the decision-making process in this respect. Actuaries should be aware that their involvement will include areas with often conflicting objectives, and they will need to use their judgement in the formulation of recommendations. The areas of input are likely to include the costing of new schemes, funding, financing and sustainability considerations, as well as considerations of adequacy and coverage.

Guideline 40. Designing a new social security scheme

While effectively involved with governmental bodies in the design and implementation of a new social security scheme, the social security institution advises all parties involved with respect to design features of the new scheme and its actuarial and policy implications. The social security institution seeks the input of actuaries in this process.

In designing a new social security scheme, the involvement of all stakeholders, namely, representatives from the government, employers and workers, is essential. Members of society should be able to participate in the processes that will have a direct impact on their lives. The benefit design should be developed in line with the needs and rights of those intended to receive the benefits. Opportunities for stakeholders to be involved in the design process will contribute to enhancing their trust and support for the scheme through a sense of ownership, as well as increasing the likelihood that benefits are closely aligned with society's needs.

The social security institution overseeing the design of a new social security scheme plays a critical role in this process by providing policy and actuarial expertise to all stakeholders. Actuaries are essential in evaluating the impacts of proposed designs of a new social security scheme.

Principles

- While participating in the design of a new social security scheme, the social security institution should advise stakeholders on adequacy, affordability and different financing approaches for the options under consideration.
- In respect of a new social security scheme, the social security institution should assess its adequacy and affordability by considering it as part of a country's overall social security system. Since private and public schemes coexist in many countries, such analysis may need to include private schemes.
- The social security institution should work with stakeholders to define what "adequacy" and "affordability" mean in the context of a particular country. In doing so, it should bring to the attention of the stakeholders international standards with respect to adequacy.
- The design of a new social security scheme, especially pension and health-care schemes, must take into account the demographic characteristics of the covered population. In particular, the impact of ageing on the scheme through decreasing fertility and mortality rates and the consequent transition of active contributors into pensioners should be considered.
- Other important aspects which should be taken into account in designing a new scheme include the impacts on savings and the incentive structure, on labour markets, on government finances and fiscal sustainability, and fairness between generations and different categories within each generation.
- An appropriate financing and funding policy of a new scheme should be established by taking into account the current economic and demographic environment as well as likely future trends.
- The social security institution should include actuaries in the discussions with stakeholders.

Mechanism

- The contribution rate of a new scheme should be set by paying due attention to the roles of existing schemes. The resulting overall benefits and total contribution rate (if all schemes are taken into account) should strive to achieve a balance between overall benefit adequacy, the affordability of total contributions and the sustainability of the resulting system.
- In principle, the social security institution should set the contribution rate in such a way as to ensure that the desired benefit level will be attained after a standard career. It should also take into account the variation in career patterns of the covered population and the benefit objectives of the system for those who do not enjoy a full working career.
- The social security institution should refer to the ILO Conventions and Recommendations in the design of a new social security system.
- The actuary should develop indicators that illustrate the evolving demographic environment of a new social security scheme. For example, the dependency ratio (the ratio of the number of beneficiaries to the number of contributors), and changes in it, gives a good indication of the ageing process.
- The actuary should assess the cost of a new social security scheme under different financing approaches, for example, PAYG , partial funding and full funding. Recommendations as to the most appropriate financing approach should take into account, but are not limited to, the following factors:
 - The current and expected future demographic characteristics of the covered population;
 - The current and expected future economic environment of a country;
 - The degree of development of national financial markets and access to international financial markets;
 - The skills and expertise available internally and externally to manage assets;
 - Any goals set by stakeholders for the use of a new system income, e.g. socially responsible investments;
 - The financing approaches used by other parts of the social security system as well as by private schemes, if applicable. Such analysis should be undertaken in order to minimize impacts of future negative developments on the overall affordability and adequacy of the system.
- Recommendations on the structure and design of a provident fund scheme should take into account the setting of appropriate minimum rates of return and the possibility of withdrawing part of the benefit before normal retirement date (including the modalities and potential impacts of such withdrawals), as well as financing and adequacy considerations.

Guideline 41. Valuation and costing of a new social security system

At the inception of a scheme the social security institution carries out an actuarial valuation in order to address the level of protection that can be provided with a given level of financial resources and what financial resources are necessary to provide a given level of protection. The social security institution considers the factors affecting the analysis that are identified through the actuarial assessment of a new social security system.

Key design parameters of the scheme, such as the minimum and maximum earnings subject to contribution, the type and level of benefits provided including the benefit formulae, eligibility requirements, retirement ages, the indexation of benefits and the schedule of contribution rates, determine the average benefit level as well as respective benefit levels for different income groups and generations and, at the same time, the cost of the scheme.

The difficulty of evaluating the costs of a new scheme relates to the high level of uncertainty associated with the development of assumptions that cannot be based on the scheme's specific experience and reliable data. At the same time, the success of the new scheme and its good governance rely on decisions having a solid factual basis and on the conclusions and recommendations of actuarial valuations. This guideline should be read in conjunction with the guidelines in Part A.

Principles

- The social security institution should put in place mechanisms for data collection and analysis as an important part of the implementation of a new social security system. Reference should be made to the *ISSA Guidelines on Information and Communication Technology*.
- The social security institution should communicate to stakeholders that there could be long-term substantial cost increases due to the ageing of the scheme. This process may result in future changes to contribution rates and/or benefits.
- The provision of quantitative information to stakeholders is essential for making informed decisions.
- Various stakeholders, namely tripartite partners comprised of government, workers and employers, may express their views on the benefit design and the financing structure and resources, especially the contribution rates, of the new scheme. The social security institution should ensure that these views are actuarially assessed and their financial implications communicated to stakeholders.
- The valuation of a new social security scheme should be based on the best-estimate assumptions of the actuary. In the case where assumptions are prescribed by legislation or by other authorities, the set of results based on the actuary's best-estimate assumptions should be presented to stakeholders in addition to the results based on prescribed assumptions.
- The initial valuation of a new scheme is crucial for ensuring future adequacy of benefits and sustainability of the scheme. Hence, the social security institution should ensure that an actuary performing the initial valuation possesses the required qualifications as described in Guideline 49.
- The social security institution should recognize that there is a high degree of uncertainty in the actuarial valuation of a new scheme and should communicate this uncertainty to stakeholders.

Mechanism

- Data collection and analysis procedures should follow Guideline 2.
- The assumptions of the actuarial valuation of a new scheme could be set by relying on past general economic and demographic statistics and/or using experiences of social security schemes in other countries with similar characteristics. The judgement of the actuary is essential in respect of the relevance of data and assumptions to be used for the valuation.
- In the valuation the actuary should demonstrate that demographic changes such as ageing of the scheme could result in long-term substantial financial and/or design implications.
- The actuarial valuation of a new social security scheme should provide a projection of the scheme's expenditure based on different scheme parameter options and financing methods proposed by stakeholders, and provide recommendations on the schedule of contribution rate changes under each option.
- The social security institution should provide necessary quantitative information to stakeholders to enable them to make informed decisions, paying due attention to the right balance between benefit adequacy and affordability.
- As in the actuarial valuation of an existing social security scheme, relevant indicators should be explained and provided to decision-makers to facilitate decision-making. These indicators may include the following:
 - Legal and effective coverage rate;
 - Demographic dependency ratio;
 - Financial ratio (replacement rate);
 - PAYG cost rate;
 - General average premium;
 - Reserve ratio;
 - Year when reserve fund is exhausted;
 - Current and projected actuarial balance sheet and funding ratio on a basis that is consistent with the programme's financing (e.g. on an open group basis for PAYG and partially funded programmes);
 - Income, expenditure and reserves as a percentage of GDP;
 - Utilization rate for health schemes;
 - Average claim per capita for health schemes.
- The horizon for the actuarial projection of a new scheme should be consistent with the scheme's design and objectives. For example, for a pension scheme, this horizon should be 75 years or more so that most of the current contributors will finish receiving benefits within the projection period. This issue is closely related to determining the financing mechanisms or, alternatively, the methodology for setting the level of reserves to meet the scheme's future benefit obligations. In making decisions, the actuary should consider Guideline 4.

- The actuary should use best-estimate assumptions in order to assess the long-term financial implications of different design options, taking into account views of stakeholders. In determining assumptions, the actuary and the social security institution should take into account Guideline 3.
- Due to the high degree of uncertainty of the actuarial valuation of a new scheme, it is essential that the actuary should carry out extensive sensitivity analysis of the scheme based on a wide range of different assumptions. The actuary and the social security institution should refer to Guideline 8.
- The social security institution should examine the financial viability of the scheme under various economic and demographic scenarios and provide information to the stakeholders of the risk that the scheme may face in a different socio-economic context in the future. In this process, the actuary and social security institution should refer to Guideline 33.

Guideline 42. Funding and financing considerations

In respect of the financing of a social security scheme, the social security institution establishes a formal written funding policy which takes into account factors relevant to the scheme as well as the socio-economic context of the country. An actuary takes into account the funding policy while preparing any actuarial valuation of the social security scheme.

The purpose of a funding policy is to establish a framework for funding a social security scheme by taking into account factors relevant to the scheme. These factors include: benefit security and adequacy, stability and/or affordability of contributions, the evolution of demographic characteristics of the scheme's members, the financial situation of the scheme, the legal provisions of the scheme, and any substantive commitments such as benefit indexation.

The funding policy provides guidance to the actuary in the selection of valuation methodologies and assumptions in accordance with actuarial standards of practice and respecting the scheme's risk tolerance. The consideration of the funding policy by the actuary is essential to ensure that the funding objectives are met with respect to securing benefit levels and payments in line with the rules, and stability and sustainability of the contribution level.

Principles

- A funding policy should be a formal written document and be publicly available.
- The funding policy should define the scheme's funding objectives, describe key risks faced by the scheme and identify funding volatility factors.
- The social security institution should seek an actuary's input in any funding policy development and improvement.
- The desired funding level should take into account the demographic and economic environment of the country.
- It is necessary to consider affordability of contributions and benefit adequacy under the socio-economic status of the specific country.
- The funding policy should be established by striking the right balance between benefit adequacy, contribution affordability and sustainability over a long-term horizon.

Mechanism

- The social security institution must inform the actuary conducting the actuarial valuation of the scheme about its funding policy.
- In performing an actuarial valuation, the actuary should follow the formal funding policy. It is recommended that the actuary should clearly state in the report the funding policy that he or she has adopted in the actuarial assessment.
- In the absence of a funding policy for the scheme or in the case when there is only an informal funding policy, the actuary should clearly indicate in his or her report what funding policy he or she has assumed and his or her reasoning and judgement of why he or she has assumed such a policy.

- The desired level of pre-funding should be chosen with attention to the following considerations:
 - A higher funding level is generally more suitable in situations where the expected future real rate of return on investments is higher than the expected real growth of wages, expressed as the sum of the employment growth and the real average individual salary growth. However, higher funding levels are only appropriate in situations where long-term and stable investment opportunities and investment management expertise exist;
 - A high level of pre-funding is not suitable in countries with unstable macroeconomic conditions and/or limited investment opportunities. It is also not recommended to have a high funding level where there exist significant risks associated with high inflation, limited investment opportunities and insufficient investment management expertise, lack of investment governance resources and/or possible abuses of scheme funds;
 - A lower funding level is more suitable in countries where the expected future real growth of wages is higher than the expected future real rate of return on investments.
- The level of pre-funding should be monitored and adjusted as the economic and demographic environment of countries evolves.
- The desired level of pre-funding is likely to vary according to the type of the social security scheme. For example, for a scheme providing post-retirement health benefits, the level of pre-funding depends on the contribution structure after retirement.
- Social security schemes often establish a ceiling of administrative expenses as a percentage of income or a percentage of investment income. In such cases, the level of funding automatically leads to an increased ceiling on the administrative expenses which might be viewed as unreasonable. The social security institution should be aware of this issue so that supplementary resources could be used for more pressing needs such as benefit improvements and/or enhancing financial sustainability of the scheme, and not on unjustified increases of administration expenses.
- The actuary should be involved in the development of the funding policy. In particular, the actuary should render assistance in assessing risks faced by the social security scheme (Guideline 33), degree of pre-funding of the scheme (asset liability management, Guidelines 21 and 22), affordability of contributions (Guideline 43), and adequacy of benefits and coverage (Guidelines 44 and 45).

Guideline 43. Sustainability considerations

As a part of sound social security scheme governance, the social security institution continually monitors the sustainability of a social security scheme.

The notion of sustainability may encompass not only financial but social and political sustainability. Public trust and confidence in the design, implementation and operation of the scheme are a major factor contributing to the sustainability of the scheme.

This guideline provides guidance about the sustainability considerations that should be into account to ensure the good governance of a social security scheme. It should be read in conjunction with Guideline 1 of these Guidelines and Section B.4 of the *ISSA Guidelines on Good Governance*.

Principles

- Social security institutions should undertake periodic actuarial reviews of the schemes for which they are responsible. The major purpose of actuarial reviews is to establish the contribution rates in future years to meet the cost of the benefits provided under the scheme, to provide financial projections of the impact of changes in benefits and contributions as needed, and to assess risks to which schemes are exposed. Guideline 1 provides additional information.
- The social security institution should develop financial indicators to measure a sufficient level of funding that ensures the sustainability of the scheme. These indicators as well as the rationale for the choice should be documented.
- The social security institution may consider the introduction of automatic adjustment mechanisms aimed at maintaining the sustainability of the programme. Automatic adjustment of certain parameters (e.g. benefit indexation, benefit reduction, contribution rates) could be established, depending on the demographic and financial status of the scheme and on the basis of discussions and decisions of stakeholders.
- The social security institution with the assistance of the actuary should periodically assess the level of intergenerational transfer present in the social security scheme. The extent of intergenerational transfer depends on the demographic and economic context as well as the financing approach adopted by the scheme. For example, under a pure PAYG system, current contributions are fully used to pay for benefits of previous generations, which implies intergenerational transfers. PAYG approaches with smoothed contribution rates over a certain time period imply a certain amount of pre-funding of benefits, which reduce such transfers. Intergenerational transfer may be intentional and (implicitly) accepted by the scheme's participants. For example, contributors to a social security pension scheme may generally accept that the first generation of pensioners of the scheme will receive relatively larger benefits in relation to their own contributions because the initial contributions were lower due to lower general standard of living compared with future generations. However, an excessive level of intergenerational transfer may lead to social and political unsustainability of the scheme. The actuary should assess the level and nature of such transfers to contribute towards appropriate decision-making.

Mechanism

- The social security institution should follow the legislative requirements regarding the frequency of the actuarial review.
- The law governing social security retirement schemes usually requires that actuarial reviews of a social security system should be undertaken periodically, for example, at least every three or five years.
- In the absence of legislative requirements, the social security institution should establish and follow an internal policy on the frequency of actuarial reviews. In addition, where data and resources allow it and depending on the nature of scheme benefits and the financial size of liabilities, valuations should be carried out more frequently if it is felt this adds value to stakeholders and the management of the social security scheme.
- A social security institution which manages schemes for benefits other than pensions, including health care, employment injury and unemployment insurance schemes, should carry out actuarial reviews on an annual basis.
- Automatic adjustment mechanisms should provide a safety net to maintain the sustainability of the social security system without excluding stakeholders from decisions (see also Guideline 19). In this regard:
 - Such mechanisms may depend on demographic ratios of the scheme, economic parameters and/or combinations of these;
 - The social security institution should perform a detailed analysis of the impacts of the application of such mechanisms on affordability, adequacy and sustainability of the social security scheme;
 - The actuary should be involved in the design, assessment and application of automatic adjustment mechanisms.
- Even if contributors to a social security scheme generally accept that the first generations of pensioners of the scheme receive benefits that exceed the value of their contributions, it is important for the social security institution and other stakeholders to set the level of benefits and contributions in such a way as to maintain an acceptable relationship between benefits and contributions for future generations. Intergenerational equity may influence the choice of a financing strategy and the level of reserves. The actuary should develop appropriate measures of intergenerational equity. For example, these measures may include the following or a combination of them:
 - Internal rate of return for different cohorts;
 - Ratio of present value of benefits to present value of contributions over a contributor's lifetime;
 - Ratio of present value of total contributions to annual value of the pension.
- The measures used by the social security institution to assess the sustainability of the social security scheme should be consistent with the programme objectives and financing approach. For example, for PAYG and partially funded schemes, the social security institution should assess sustainability by taking into account present and future contributions of workers and employers, state subsidies, investment income, and benefits of present and future contributors (i.e. an open group valuation).

Guideline 44. Benefit adequacy

The social security institution regularly assesses the level of protection offered by the scheme through the actuary's analysis of the replacement rate and other relevant adequacy measures. When assessing benefit adequacy of a pension scheme, the social security institution considers retirement income from other sources, such as any universal non-contributory pension, mandatory or voluntary occupational or individual pension plans, and/or legislated end-of-service payments.

Inflation, salary increases and the regularity of the adjustment of the scheme's parameters (such as a salary ceiling used for benefit calculations) affect adequacy of benefits. For instance, a salary ceiling used to determine benefits that is not periodically adjusted at least in line with average wage increases will gradually make benefits less significant for high or medium wage earners.

The ILO has several legal instruments, such as the Social Security (Minimum Standards) Convention, 1952 (No. 102) and Recommendation concerning National Floors of Social Protection, 2012 (No. 202), which provide guidance for ensuring benefit adequacy as well as the scope and extent of coverage for all nine branches of social security, namely medical care, sickness, unemployment, old age, employment injury, family, maternity, invalidity and survivors' benefits.

Principles

- The social security institution should initiate and/or support initiatives that are aimed at providing adequate benefits to the current and future covered populations.
- The social security institution should take into account the actuary's analysis and observations on the attainment of the earnings replacement objectives of the scheme.
- Retirement income from sources other than the social security pension scheme should be considered when assessing the benefit adequacy of a social security pension scheme.
- The actuary should assess the evolution of replacement rates and/or other relevant indicators (e.g. pension wealth) for different classes of earnings and different career histories, and should signal any evolution of benefit adequacy likely to be contrary to the objectives of the scheme. Such evolution may be due to an irregular or insufficient adjustment of the scheme's parameters (for example, benefit adjustments in line with inflation or salary increases) or from external trends.
- In the case of a country which has not ratified ILO Convention No. 102, the social security institution should work with stakeholders towards advancing the process of ratification. Actuaries should provide the social security institution with any necessary information of an actuarial nature that could help to advance the ratification process.
- ILO Convention No. 102 requires ratifying member States to implement at least three out of the nine branches of social security, with at least one of those three branches covering a long-term contingency or unemployment.
- The ILO Conventions are binding upon those member States which have ratified the Convention.

Mechanism

- The actuary should calculate actual scheme replacement ratios under different scenarios, and compare them with the theoretical replacement rate of the scheme's provisions.
- The actuary should analyse the average amount of benefits and the distribution of benefit amounts in relation to relevant indicators such as average insurable earnings, the national average wage, the minimum wage, the minimum subsistence level and the poverty line in order to analyse and assess the adequacy of benefit provisions. The average amount of benefits for different profiles of beneficiaries, for example by gender and by career profiles, should also be analysed as far as possible.
- It is particularly important that the actuary assesses the risks associated with any lump-sum payments (for example from defined contribution schemes), and the impact of the prevailing and future socio-economic environment on benefit adequacy. This can be undertaken by analysing the possible replacement level through the conversion of the lump-sum amount into periodical payments based on different economic and demographic assumptions (such as inflation, wage increases, rate of return on investments and life expectancy) at the time of retirement. Guideline 18 provides more details of lump-sum conversions to income.
- The social security institution should use adequate adjustment mechanisms in order to avoid gradual erosion of the real benefit value. For example, past earnings used for benefit calculations could be adjusted in line with average wage increases in the intervening period and benefits in payment in line with average wage increases or inflation.
- The social security institution should refer to ILO Convention, 1952 (No. 102) to ensure that the rates of current periodical payments in respect of old age, employment injury (except in case of incapacity for work), invalidity and death of the breadwinner comply with its requirements and ensure that these rates are regularly reviewed. The social security institution should also refer to ILO Recommendation No. 202.

Guideline 45. Coverage

The current legal and effective coverage situation are analysed both in the light of current legislation and scheme administration, as well as within the global context of employment trends and population changes which may trigger changes in both legal and effective coverage.

This guideline discusses the considerations that should be taken into account when the actuary assesses social security scheme coverage. The extent of social security scheme coverage not only has significant implications for the scheme's financing, but also has policy implications for the type and extent of the social security benefits provided today and in the future. The extent of coverage is a key driver in determining whether the population has access to social protection. The effective coverage rate is an implicit indicator of the efficiency of the administration, notably in ensuring access for the population and enforcing contribution collection. It also has significant financial implications for the scheme. This guideline should be read in conjunction with Guideline 3.

Principles

- Member States which have ratified ILO Convention No. 102 must ensure that minimum standards for coverage established for each of the nine branches as a minimum percentage of the reference population are implemented in practice.
- Valuations of the financial impact of the extension of coverage should be based on the assumptions made regarding the extension of the effective coverage of contributors.
- Legal and effective coverage measures should be differentiated. It is important that both inactive and active affiliated members should be taken into account for projections.
- Measurements of effective coverage should reflect how legal provisions are implemented in reality. Effective coverage is usually lower than legal coverage because of compliance and enforcement challenges.
- The social security institution should analyse current legal and effective coverage in order to make appropriate policy decisions that will affect the design of the scheme. This, in turn, may affect the assumptions made regarding future effective coverage in different options analysed in the actuarial valuation.
- Assumptions regarding future legal and effective coverage will also be based on the political willingness to extend coverage to groups not yet legally covered and the planned measures to reinforce the administrative capacities of institutions to achieve these objectives.
- The evolution of the covered population will depend on future employment and demographic changes relevant to the scheme.
- The social security institution should recognize that the judgement of the actuary is essential for projecting coverage rates for the reference population, as well as for population subgroups (coverage rates by age or age-bands, gender or industry, etc.).
- Whenever stakeholders decide upon a reform aimed at extending coverage of the existing scheme, the appropriate actuarial analysis should be performed to assess the impact on the social security scheme and evaluate the adequacy of benefits for the extended reference population.

Mechanism

In developing assumptions on the future evolution of coverage rates, the actuary should consider the following:

- In the case of a scheme covering employed workers as contributors and/or beneficiaries, the actuary should assume that the future evolution of the number of effective active contributors and/or beneficiaries will depend on the trends in the employed population.
- The actuary should analyse legal and effective coverage rates classified by major subgroups of the reference population. For example, in many countries labour force participation rates of women are significantly lower than those of men. In this case, the actuary should assess whether it is reasonable to assume that the labour force participation rates of women will increase faster than those of men.
- In the case of a scheme covering employed workers as contributors and/or beneficiaries, age-specific effective coverage rates (number of active insured persons at each age as a percentage of the total employed population at the same age) are determined as of the valuation date. The actuary, jointly with the social security institution, needs to determine whether these age-specific effective coverage rates will remain constant for the whole projection period or will gradually change in line with the trends (for example, in line with trends in the formalization of the labour market where the scheme covers formal economy wage earners and/or trends in legal enforcement). This will ensure consistency of the coverage assumptions with macroeconomic and labour trends over the long term. The resulting coverage rates should be realistic and justified.
- In projecting the effective coverage of any civil servant schemes, the actuary, jointly with the social security institution, should make an assumption regarding the rate of growth of the public sector.
- In the case of a reform to extend legal or effective coverage, the social security institution should consider different scenarios in order to illustrate the income and cost progression with expanded coverage and to provide PAYG rate projections as well as other relevant financial and demographic indicators. The actuary should use judgement when assessing coverage extension. He or she should consider the national socio-economic context and take into account the views of stakeholders.
- In developing assumptions on future effective coverage rates, the actuary should consider potential changes in programme administration and enforcement, e.g. if additional resources at the institutional level are invested into improving workplace inspection, maintaining social insurance records, and administration of benefits. The actuary must consult with management and quantify expectations.
- As coverage has significant financial implications for the scheme, the social security institution should subject the coverage variable to extensive sensitivity analysis using different demographic and economic scenarios as well as different assumptions on the coverage rate reflecting future socio-economic developments and administrative efficiency. The impacts of potential legal and administrative changes should also be considered.

- Estimates of the extent of legal coverage should use both information on the groups covered by statutory schemes for a given social security area (branch) as specified by legislation, and available statistical information quantifying the number of legally covered persons at the national level.
- When measuring the extent of effective coverage, a distinction must be made between coverage measured in terms of protected persons and in terms of actual beneficiaries:
 - Protected persons are those who have or will have to the potential to be covered for benefits but may not necessarily be receiving them, e.g. those who pay social insurance contributions for a specified contingency such as old-age pensions and unemployment benefits;
 - Beneficiary coverage rate describes the proportion of actual beneficiaries of social security benefits (e.g. old-age pensions, unemployment benefits) over those who should be covered (e.g. all the population over the retirement age, all unemployed people).

Guideline 46. Implications of changes and reforms in benefits and financing

Actuarial involvement is required when both parametric and structural changes to the social security scheme are considered.

Changes in social security schemes are often triggered by concerns regarding future financial sustainability and current and future benefit adequacy. Reforms to programmes and the overall system may be parametric, i.e. mainly concerned with changes in eligibility criteria, benefit levels and the financing of the scheme. Structural reforms refer to more significant changes in the nature of benefits, including the introduction of new social insurance schemes, adopting new benefit provisions (e.g. covering new contingencies) or other changes to the nature of benefits (e.g. a move from defined benefit to defined contribution provision).

Principles

- Scheme changes should be discussed with all stakeholders, including tripartite partners, and decisions should be made through a dialogue process. Decisions regarding structural and/or parametric reforms should be based on actuarial valuations and other actuarial calculations which may be performed on an ad-hoc basis to consider the impacts of proposed changes.
- Actuarial valuations and calculations should be performed using appropriate methodologies and a range of assumptions. They should produce results that can be used to measure the financial impact of proposed changes on the sustainability of the scheme and the adequacy of benefits.
- Parametric changes to a social security scheme may concern benefit eligibility conditions, the package and/or level of benefits, the inclusion of a new category of insured population, and/or financing provisions (including changes in the contribution rate).
- In the case of multi-pillar systems, modifications to other components of retirement and health benefits (such as introduction of or changes to mandatory occupational retirement schemes, private health schemes) may also require a review of the benefit provisions of the social security scheme.
- The actuary should provide recommendations regarding modifications to the scheme provisions based on the results of actuarial valuations and other calculations.
- The introduction of structural reforms may also have an impact on other branches of the social security system. The actuary should perform extensive analysis to assist stakeholders in making informed decisions.
- When structural or parametric changes are introduced to the social security scheme, it is important for the social security institution as well as other stakeholders to address the question of protection of accrued rights. An actuarial valuation should be conducted to assess the degree of protection of accrued rights resulting from structural reforms.
- Changes in benefits and financing can affect several generations. In introducing changes to the scheme, it is important to provide a sufficient transition period prior to the full implementation of changes in order for people to have enough time to adjust their behaviour. Actuarial input into the implications of different reform proposals on adequacy and financing costs will feed into this analysis.

Mechanism

- Material changes to the scheme should require a dedicated actuarial report and calculations. This report should present decision-makers and all other stakeholders with the financial impacts as well as the impact on benefit adequacy of the proposed changes.
- Modifications of other benefit components in a multi-pillar system often need an evaluation by an actuary in order to assess the impact on overall benefit adequacy. The actuary should present in the actuarial report long-term demographic and financial impacts of any proposed modifications. These projections should be compared with those produced under current legal provisions.
- Guideline 41 on the valuation of a new scheme should be referred to when structural reforms are proposed or introduced (e.g. new contingency benefits, the extension of coverage to new categories of workers, etc.).
- Material changes in the design of the scheme should be clearly communicated to beneficiaries. More details on communication are provided in Part D, especially Guideline 27.

H. Actuarial Expertise, Staffing and Training within the Social Security Institution

The social security institution should ensure that the skills and experience requirements of internal and external actuaries undertaking work for the organisation are well defined, adequate and monitored. The institution should support the efforts of actuaries in obtaining relevant qualifications and undertake training and continuing professional development activities as set out by national or international professional bodies. The social security institution should consider a range of issues when assessing whether an internal or external actuary is more appropriate to carry out actuarial work. There should also be appropriate coordination and communication between the actuary/actuarial department and finance and human resource departments to ensure objectives are met and that the resources to carry out the tasks are available.

Guideline 47. Independence of the actuary

The social security institution and supervising authorities take measures which seek to ensure and maintain the independence of the actuary.

The quality, accuracy and reliability of the actuarial work carried out for, and on behalf of, a social security institution will depend on safeguarding the independence of actuaries and their work. The actuary may face internal pressures or constraints from within the institution. There may also be external pressures (for example political) faced by the actuary and/or the social security institution. Such threats to the independence of the work undertaken should be mitigated through appropriate internal policy measures as well as legislative and regulatory support. The social security institution should also put in place safeguards to assess whether the actuary is faced with any conflict of interest and measures that should be taken in such cases.

Principles

- The social security institution should, where possible, input into the regulatory mechanisms supporting the independence of the actuary and promote and support the resulting legislation and regulation arising.
- Notwithstanding any existing legislation that applies, the social security institution should put in place internal policies and procedures ensuring that:
 - The actuary is not unduly influenced by external or internal considerations that may affect the results and recommendations of his work;
 - The actuary is able to undertake his or her activities without undue and unjustified internal or external interference.
- When the independence of the actuary is compromised, the actuary should highlight the resulting financial and operational implications and communicate these to relevant stakeholders. This action should be supported by the social security institution.
- The question of the independence of the actuary should be part of the risk management process of the institution.

Mechanism

- The actuary should have sufficient access to data, choice over the most appropriate methodology and assumptions to use, and not be unduly influenced by external considerations or subject to internal pressure that may impact calculations, results and recommendations.
- The social security institution should facilitate the independence of the actuary through the setting up and monitoring of appropriate procedures. Procedures for internal peer review, external expert review, and operational control within the context of an effective governance framework should be set out clearly in written documents.
- The social security institution should set down and respect a written policy specifying actions to take when independence is not respected. A designated senior staff member or independent expert should regularly monitor whether such procedures are being correctly followed.

- There should be regular reporting which examines whether the independence of the actuary is maintained, the steps taken to guarantee this independence and measures available when this does not occur. In addition, the external review of actuarial work should incorporate an assessment of whether the actuary acted free of any unjustified internal or external constraint (for example, in the setting of assumptions).
- Particular emphasis should be placed on actual, potential or perceived conflicts of interest faced by the actuary. Methods to assess conflicts of interest as well as relevant training for relevant members of staff involved in performing actuarial work should be provided. Appropriate peer review processes should support this objective.
- Measures taken should be consistent with, and will draw on, existing general governance practices and risk management processes which aim to minimize risks in such situations. This may be particularly important in respect of the provision of professional advice and its separation from decision-making.
- The actuary and social security institution should draw on national and international actuarial standards and good practice recommendations to support the independence of the actuary.

Guideline 48. The choice between the use of external or internal actuarial expertise

The social security institution decides whether internal or external expertise is to be used to carry out the actuarial work related to social security schemes. The social security institution seeks to develop the internal actuarial expertise to perform actuarial work for a social security scheme.

The choice of whether to use external or internal actuarial expertise should be made in the context of the particular social security institution and should take into account the environment in which the institution operates. In making this decision, the social security institution should consider the needs and characteristics of all social security schemes falling under the institution's responsibilities. Given the different potential areas of actuarial involvement, the choice regarding internal or external actuarial input may depend on the type of work that needs to be undertaken.

Principles

- The social security institution should aim at creating an internal actuarial department that would be responsible for part or all of the actuarial work to be undertaken. Guidelines 49 to 51 provide information on steps that should be taken to achieve this.
- Based on the institution's priorities, the social security institution should assess advantages and risks of using external and internal actuarial expertise in different areas of actuarial involvement. The assessment process should be properly documented. The existing arrangement with respect to the use of external or internal actuarial expertise should be re-examined on a regular basis to assess whether it continues to address the evolving needs of the social security institution. As the internal actuarial department develops, the social security institution should consider transferring more tasks from external providers to internal actuaries.

Mechanism

- In making the decision of whether external or internal actuarial expertise should be used, the social security institution should consider:
 - The number and complexity of social security schemes managed by the institution;
 - The nature and extent of actuarial work that needs to be performed, e.g. actuarial valuations, actuarial calculations, providing actuarial input in risk analysis and the investment process, providing actuarial advice on scheme design, etc.;
 - The existence or possible emergence of actual or perceived conflicts of interest; and
 - The likely evolution of the volume and nature of actuarial work in the future.
- The social security institution may decide to use internal actuarial expertise for some areas of actuarial activities, and external resources in other areas.
- Factors to consider in the use of internal actuarial expertise include, but are not limited to:
 - Availability of existing internal actuarial expertise, as well as skills, competencies and experience of actuarial staff;

- Feasibility of creating or enhancing internal actuarial expertise through attracting and retaining qualified individuals and developing their competencies;
- Availability of technological resources needed to conduct actuarial work;
- Ability of the social security institution to ensure internal actuarial expertise maintenance and knowledge transfer;
- Ability of the social security institution to ensure the independence of internal actuaries;
- Financial cost of carrying out actuarial work internally.
- Factors to consider in the use of external actuarial expertise include, but are not limited to:
 - Availability of reliable national or international external expertise;
 - Ability of the social security institution to conduct a transparent and competitive selection process, perhaps using a third party;
 - Consideration of the impact of a change in external actuarial service provider and subsequent transition processes;
 - Feasibility of implementing external controls of the actuarial services provided, for example:
 - compliance of actuarial work with national and/or international standards of practice;
 - appropriateness of provider's processes with respect to data including privacy issues;
 - professional qualifications of individuals performing actuarial work;
 - monitoring and prevention of conflicts of interest (real and perceived);
 - peer review processes;
 - Costs and contract terms relating to the appointment of an external actuary.
- The selection process for the recruitment of an external expert should be documented. The process is likely to include consideration of the experience and competencies of the external actuary and his or her employer, the charges and contract conditions, methodologies used, ICT systems, governance and peer review processes and professional qualifications of personnel.

Guideline 49. Qualifications

Actuaries and other social security professionals providing actuarial services for social security schemes possess appropriate qualifications and expertise necessary to fulfil their responsibilities. A qualified actuary is a member of a national (or international) professional actuarial association (or working toward fulfilling requirements to become a member) and follows applicable professional standards, rules of professional conduct and continuing professional development requirements.

The quality of the actuarial work undertaken for social security schemes depends to a great degree on the qualifications, skills and experience of the professionals performing this work. This guideline should be read together with Guideline 51 and Part F of these Guidelines.

This guideline distinguishes an actuary with a recognized actuarial affiliation or qualification requiring the formal assessment of their skills and experience (“actuary”) from other social security professionals performing actuarial work for a social security institution.

Principles

- The social security institution should define qualification requirements for actuaries and other social security professionals performing actuarial work for social security schemes.
- The social security institution should promote the development of a national actuarial profession and work closely with existing professional associations. In particular, the social security institution should ensure that national actuarial institutions have proper professional standards with respect to social security actuarial work as well as rules of professional conduct.
- The social security institution may consider promoting legislation requiring certain services and work for social security schemes to be performed by actuaries.
- The social security institution should support internal actuaries in attaining and/or maintaining required qualifications.
- The social security institution should develop controls to ensure that actuaries comply with relevant professional standards, continuing professional development requirements and rules of professional conduct.
- If the social security institution employs social security professionals to perform actuarial work who do not belong to a formal professional organization, the institution should require that these professionals follow relevant professional standards, continuing professional development requirements and rules of professional conduct of a national (or international) actuarial organization. In the case of social security professionals other than actuaries performing actuarial work, the social security institution should ensure that, in addition to actuarial standards, these professionals comply with professional standards, continuing professional development requirements and rules of professional conduct of their professional organization, including the avoidance of conflicts of interest.

Mechanism

- The social security institution should define professional requirements for individuals performing actuarial work for social security schemes. These requirements may include, but are not limited, to the following:
 - Being a member of a national or an internationally recognized actuarial society or body with sufficient experience;
 - Being a qualified professional (e.g. mathematician, statistician, economist) who has undertaken relevant training programme in actuarial techniques of social security or has proven his or her knowledge of the subject in the form of a series of examinations;
 - Being a qualified professional (e.g. mathematician, statistician, economist), whose formal qualifications are not necessarily of an actuarial nature, but have relevance to the actuarial work for social security schemes;
 - Length of relevant professional experience.
- Where possible, the qualified professional should seek to secure actuarial recognition from the relevant national body.
- The social security institution should encourage national actuarial associations to become full members of the International Actuarial Association (IAA) to ensure that national actuarial practices are comparable with the best international practices.
- The social security institution should encourage national actuarial associations to adopt ISAP 2 as well as other international standards of actuarial practice issued by the IAA and relevant to actuarial work performed for social security schemes. If national professional standards on actuarial work for social security schemes exist, the social security institution should encourage national actuarial associations to harmonize such standards with international standards of actuarial practice issued by the IAA.
- The social security institution should assist internally employed actuaries and social security professionals performing actuarial work in attending training courses and in the payment of professional and training fees that are necessary for achieving and/or maintaining qualification requirements required to perform actuarial work for social security schemes.
- The social security institution should establish well-documented procedures of regular verification of qualifications, credentials and professional experience of actuaries and other social security professionals performing actuarial work (e.g. through contacting professional organizations).

Guideline 50. Staffing and infrastructure

In the case where internal resources are used to perform actuarial work, the social security institution maintains adequate staffing levels and provides the actuarial department with the necessary resources to ensure that tasks can be carried out effectively.

This guideline should be read in conjunction with Guidelines 49 and 51.

Principles

- The social security institution should ensure the alignment of its planned activities that involve actuarial input with the availability of the appropriate human resources. Where the staffing level is found to be inadequate, appropriate human resource strategies, including the necessary budget, should be developed and implemented.
- The social security institution should identify which competencies are required to carry out the actuarial work. Where gaps in competencies, qualifications and/or experience are identified, a detailed plan should be put in place to indicate how to close these gaps.
- The social security institution should recognize specific technological needs of an actuarial department and ensure that they are properly met.

Mechanism

- The social security institution should coordinate its business, budget and human resource planning activities.
- Identified gaps in competencies, qualifications and/or experience may be closed through the combination of appropriate training programmes using external or internal resources and appropriate hiring/retention strategies, as well as other applicable measures.
- An actuarial department should identify technological and infrastructure resource requirements needed to perform actuarial work. These resources may include specific software (e.g. computer programs used for actuarial valuations, databases, management tools, etc.) and hardware (e.g. computers with sufficient computational and memory resources). These requirements should be documented, justified and discussed with the management.
- An actuarial department should identify resource requirements associated with business continuity in situations where it is affected by different levels of business interruption. These requirements should be documented, justified, discussed with the management, and reflected in the social security institution business continuity plan.
- If, in undertaking an actuarial valuation, the actuary feels that the resources available to him/her are not sufficient, this should be raised as soon as possible with the relevant internal person or department.

Guideline 51. Developing and maintaining professional expertise

An actuary and/or other social security professional performing actuarial work for a social security institution develops and maintains the high level of professional expertise necessary to perform required actuarial work. In the case of using internal resources to perform actuarial work, the social security institution ensures that actuaries and/or other social security professionals are provided with sufficient opportunities to maintain technical knowledge, professional expertise and appropriate behaviour including the managing of potential conflicts of interest.

This guideline distinguishes an actuary with a recognized actuarial affiliation or qualification requiring the formal assessment of their skills and experience (“actuary”) from other social security professionals performing actuarial work for a social security institution.

Principles

- If an actuary and/or other social security professional performing actuarial work for a social security institution is a member of a professional association that has continuing professional development requirements relevant to the performed actuarial work, they should comply with these requirements.
- If an actuary and/or other social security professional performing actuarial work for a social security institution is not a member of a professional association that has continuing professional development requirements relevant to the actuarial work performed, the social security institution should prepare a relevant professional development plan and regularly monitor compliance with such a plan.
- The social security association should encourage an actuary and/or other social security professional performing actuarial work for a social security institution to participate in national and international research in the areas relevant to actuarial work to be performed (e.g. development of economic and demographic assumptions, actuarial modelling, methodology, financing approaches, etc.).

Mechanism

- The social security institution should ensure that an actuary and/or other social security professional performing actuarial work for a social security institution has sufficient external and internal opportunities to fulfil continuing professional development requirements or a relevant professional development plan. This may include (amongst others):
 - On-site training by internal or external experts;
 - Attendance at national and international conferences, events and training, including but not limited to those organized by the ISSA, ILO, IAA and national professional associations;
 - Access to relevant training resources.
- The social security institution should allocate sufficient time and resources for continuing professional education when developing the institution’s human resources plans and budgets.
- The social security institution should facilitate the interaction of actuaries and/or other social security professionals performing actuarial work for a social security institution with national and international experts in social security, demography, economics, etc.

Acknowledgements

The *Guidelines on Actuarial Work for Social Security* have been produced jointly by the International Labour Office (ILO) and the International Social Security Association (ISSA). They were written by Assia Billig and Jean-Claude Ménard from the Office of the Chief Actuary – Office of the Superintendent of Financial Institutions, Canada, Simon Brimblecombe from the ISSA General Secretariat, and Hiroshi Yamabana, André Picard, Cristina Lloret and Anne Drouin from the ILO.

The ILO and the ISSA thank the International Actuarial Association (IAA) for its useful comments, suggestions and support. They would also like to thank the Eurostat, the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD) for their comments. They would like to thank individually the following for their input and comments: Gilles Binet, Chris Daykin, Sage De Clerck, Fabio Durán Valverde, Karen Glenn, Paul Goebel, Jens Gruetz, Yves Guérard, Philippe Guèvremont, Reza Kashef, Anna Kwiecińska, Georges Langis, Martin Lunnon, Denis Martin, Ibrahim Muhanna, Robert Olieman, Isabel Ortiz, Tibor Parnicky, Pierre Plamondon, Ulrich Reineke, Marshall Budd Reinsdorf, Junichi Sakamoto, Mick Silver, Jean-François Terrien, Jorrit Zwijnenburg, and the Pension Fund of the Russian Federation.

4 route des Morillons
Case postale 1
CH-1211 Geneva 22

T: +41 22 799 66 17
F: +41 22 799 85 09
E: issa@ilo.org | www.issa.int

