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# Training on Actuarial work

## First session: Introduction to actuarial concepts and to the ILO/HEALTH

SOCPRO, ILO

Date: Friday / 03/ June / 2022

# Agenda for the first training session:

1. ILO Principles
2. Actuarial work and actuarial models
3. Main characteristics of the ILO/HEALTH model
4. Building blocks of the ILO/HEALTH Model

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# ILO Principles

# ILO principles guiding health scheme design and reforms

## ➢ Universality

- Health and social protection as a human right
- Entitlement to benefits by law

## ➢ Adequacy

- Minimum standards per ILO Convention No. 102, ILO Medical Care and Sickness benefits Convention No. 130 and ILO Maternity Protection Convention No. 183

## ➢ Risk sharing and solidarity in financing

- Produce positive redistributive effects and do not transfer financial risk to the individual

## ➢ Overall and primary responsibility of the State

- State obligation to ensure the “financial, fiscal and economic sustainability” of the national social health protection system

# ILO principles guiding health scheme design and reforms

## Non-discrimination and gender equality

- Adoption of mechanisms to compensate for gender inequalities

## Transparent and accountable management

- Need for good governance of the system with respect to financing and administration

## Sustainability

- Financial, fiscal and economic sustainability with due regard to social justice and equality

## Social dialogue

- Need to ensure social dialogue and the representation of protected persons in governing bodies

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# Actuarial work and models

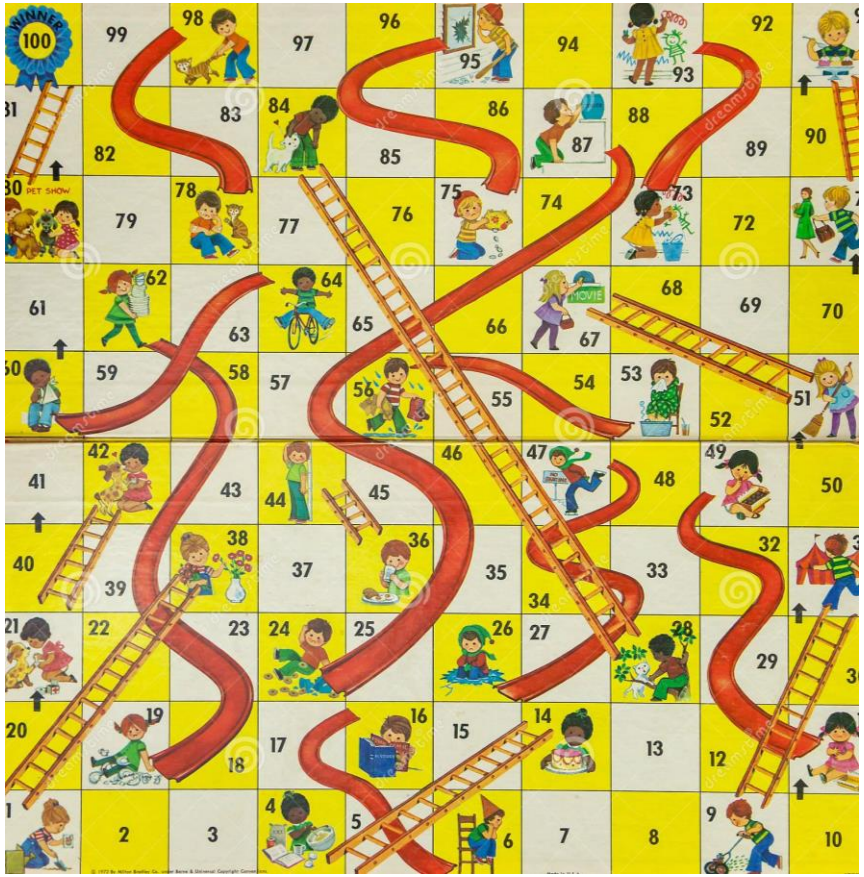
## Brief introduction

# What do we mean by “actuary”?

- **Insurance and finance are by nature random and uncertain sectors**

- **Actuaries...**
  - ✓ make the risks that result from these activities calculable.
  - ✓ Apply probability calculations and statistics to insurance, prevention, finance and social welfare issues.
  - ✓ Develop statistical bases for calculating risks.
  - ✓ Develop mathematical models to describe risks.

# What do we mean by “actuarial model”?




**Insurance works best when:**

- positive and negative outcomes can be specified with precision
- when probabilities are known with certainty and the distribution of various risks in the population is known in detail.

**Data forms the statistical base that allows the quantification of risks.**

# Actuarial valuation: types

- Actuarial valuation from the supply side: based on what is currently offered and reflected in the current use of care services. From there, services can be expanded or reduced.

- Actuarial valuation from the demand side: based on the calculation of the utilization that would be expected according to the epidemiological profile of the country.

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# Main characteristics of the ILO/HEALTH model

# General characteristics of the ILO/HEALTH Model

- **One platform, many tools:** ILO/HEALTH is part of the ILO Quantitative Platform on Social Security (QPSS). This platform contains a set of calculation, simulation and analytical tools, both actuarial and non-actuarial.

- **Allows control over operations:** The QPSS is equipped with a central administration tool (the CAT tool), which allows varying levels of control over operations related to the use of the different quantitative tools. These operations include registration of social security institutions, users, process control, data control and IT security.

# General characteristics of the ILO/HEALTH Model

- **Security and confidentiality:** Individual and institutional users have private workspaces to ensure the confidentiality of the information managed in the different tools. The ILO is has stringent protocols in place to ensure the security and confidentiality of the data stored on the platform.

- **Online:** The platform is a web-based service that runs entirely in the cloud to facilitate remote work among teams. Its security and consistency are in line with stringent ILO standards.

- **Multi-layered and responsive:** The QPSS provides users with an actuarial model as a service within a multi-layer and responsive tool to be consumed in a secure environment through the web.

# ILO/HEALTH Model: Aim

- Provide information on the financial impacts of the introduction of parameters of a given scheme/or changes to the parameters:

- Provide estimates on:
  - ✓ Future expenditures
  - ✓ Current and future funding requirements (contribution rates, tax transfers by government)
  - ✓ Simulate reserves
  - ✓ Financial consequences of parameter changes
  - ✓ Identification of additional funding requirements

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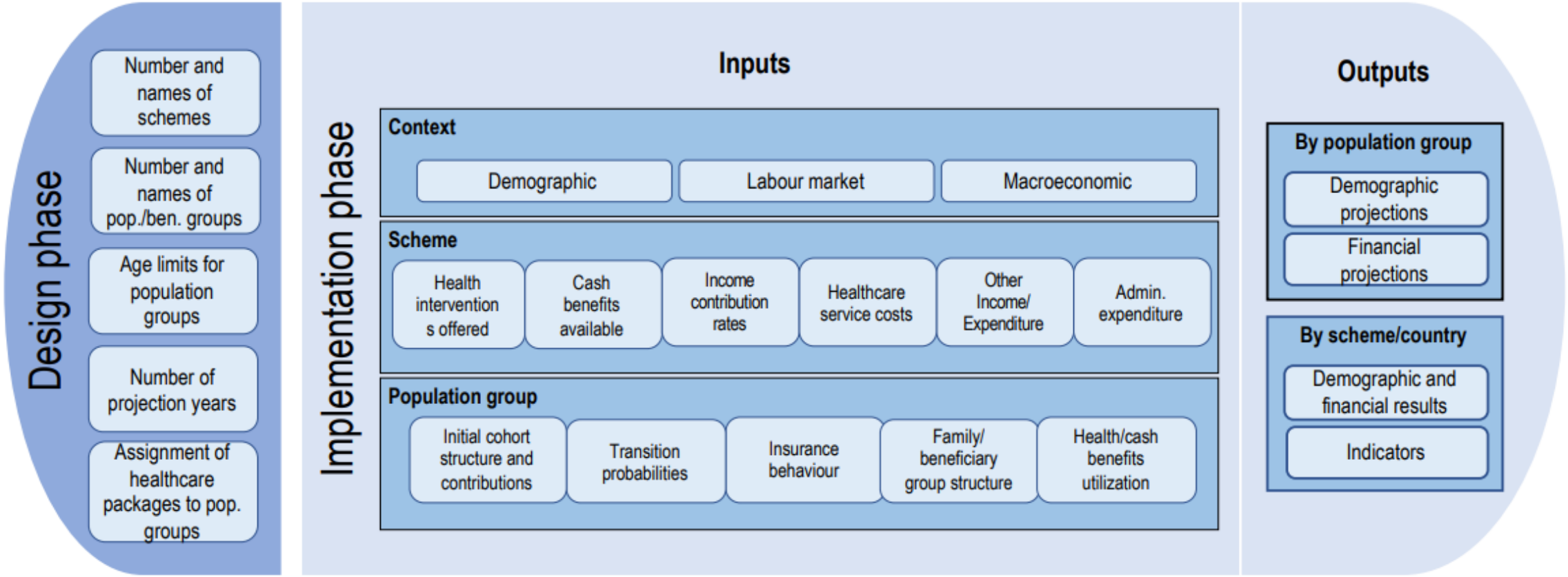
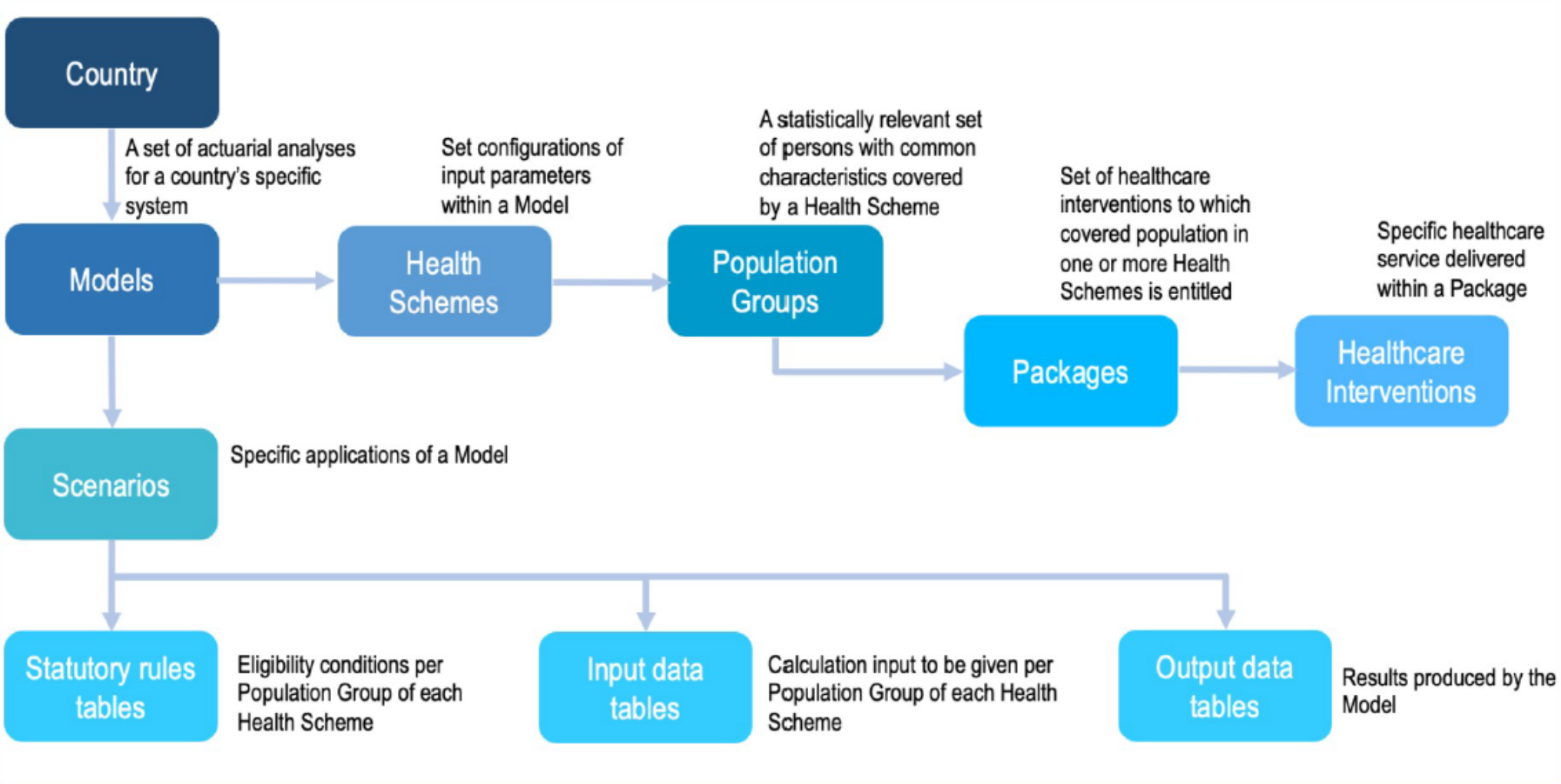
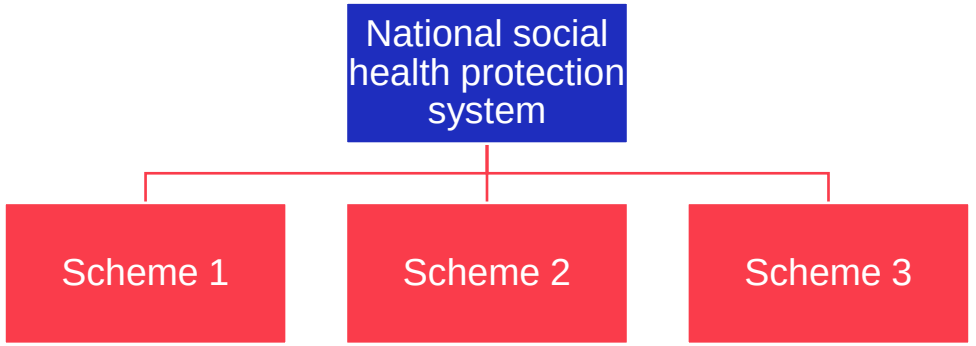
# Building blocks of the ILO/HEALTH Model

# ILO/HEALTH Model: Overview of the building blocks




Country
A set of actuarial analyses for a country's specific system
Models
Set configurations of input parameters within a Model
Health Schemes
A statistically relevant set of persons with common characteristics covered by a Health Scheme
Population Groups
Set of healthcare interventions to which covered population in one or more Health Schemes is entitled
Packages
Specific healthcare service delivered within a Package
Healthcare Interventions
Scenarios
Specific applications of a Model
Statutory rules tables
Eligibility conditions per Population Group of each Health Scheme
Input data tables
Calculation input to be given per Population Group of each Health Scheme
Output data tables
Results produced by the Model

# Design phase




- **ILO/HEALTH creates an initial definition of the health care schemes** that make up a national social health protection system.
- A national health system may **include one or more schemes functioning at the national or sectoral level.** Thus, there can be national single-scheme models and multi-scheme models.
- **Each scheme has its own rules and population groups.**

# Population group

Set of individuals with statistically similar characteristics that affect their access to a health care scheme under its rules.

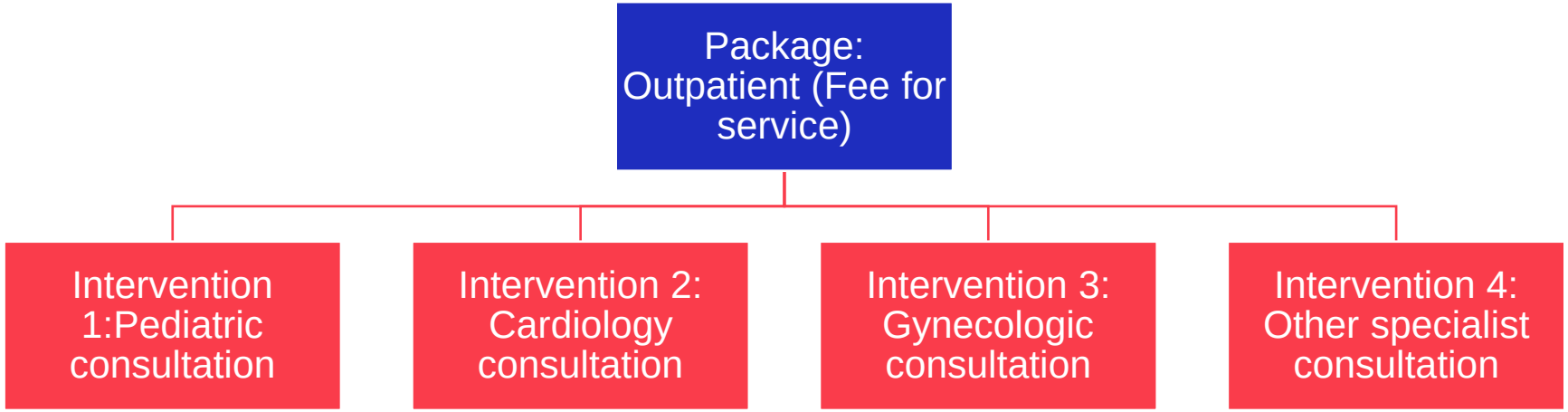
Population group determinants include:

- Scheme eligibility conditions
- Exposure to risk
- Salaries
- Demand for healthcare interventions

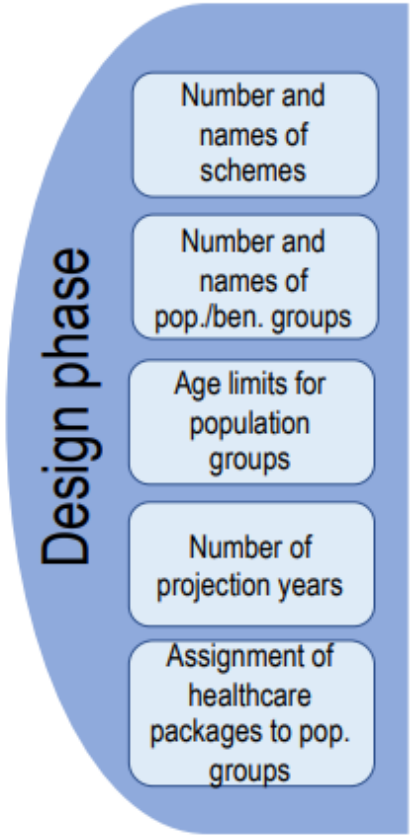
# Health Intervention and Packages

| | |
|---|---|
| Health intervention | • Set of health care services provided<br>• Single account units that can be **counted and costed** |
| Health package | • Set of health interventions provided under a **payment method (Fee for service, capitation, budget allocation)** |

# Health Intervention and Packages: example

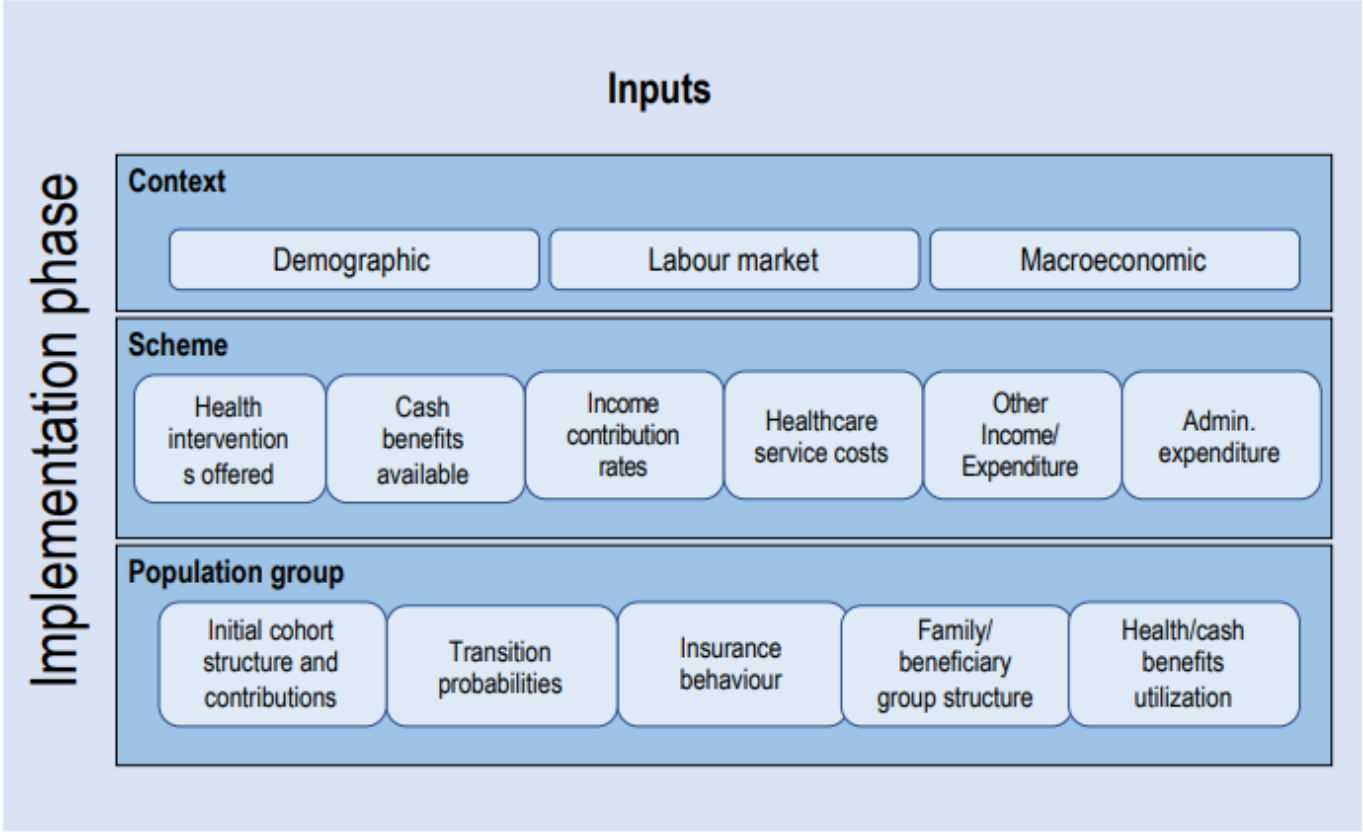


# Design phase




1. Users define the health interventions and group them into packages.
2. Users establish parameters such as projection period in the tool to set up their definitions of different models.
3. Users should define the health care schemes they are going to model, the population groups belonging to each scheme and the age limits of each population group within the scheme.
4. Users define each health care scheme as contributory or non-contributory. At least one population group must be covered by each scheme.
5. Each group in a contributory scheme contains certain sub-groups: past contributors with remaining coverage, survivors, disability and old-age pensioners and family members. For non-contributory schemes, those covered are defined individually.

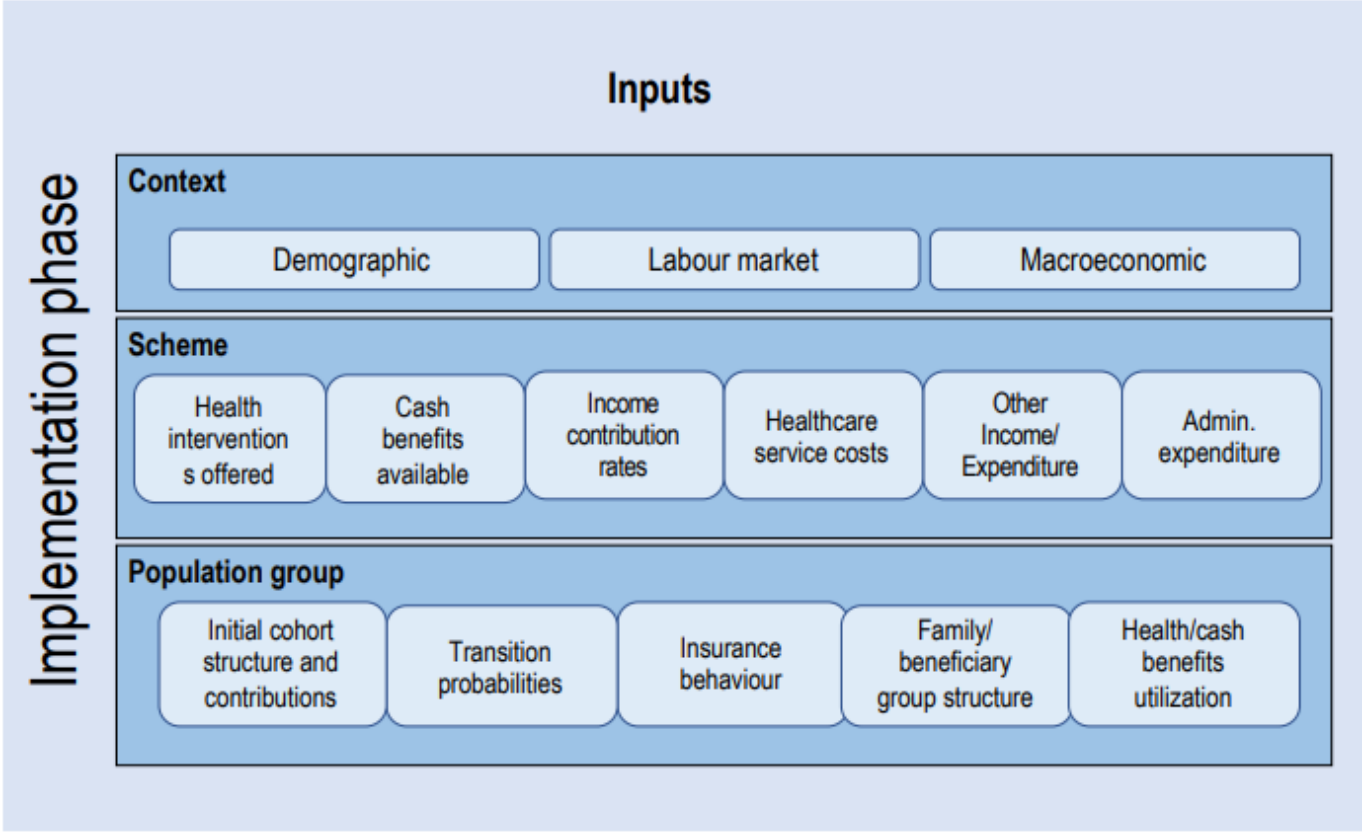
# Implementation phase: Model inputs




## Inputs of Context:

- A set of national-level variables and parameters.
- These include projections of the national population by sex, rates of participation in economic activity by sex, and a set of basic parameters for the macroeconomic framework, including GDP growth rate, inflation rate, salary growth rate and interest rate.

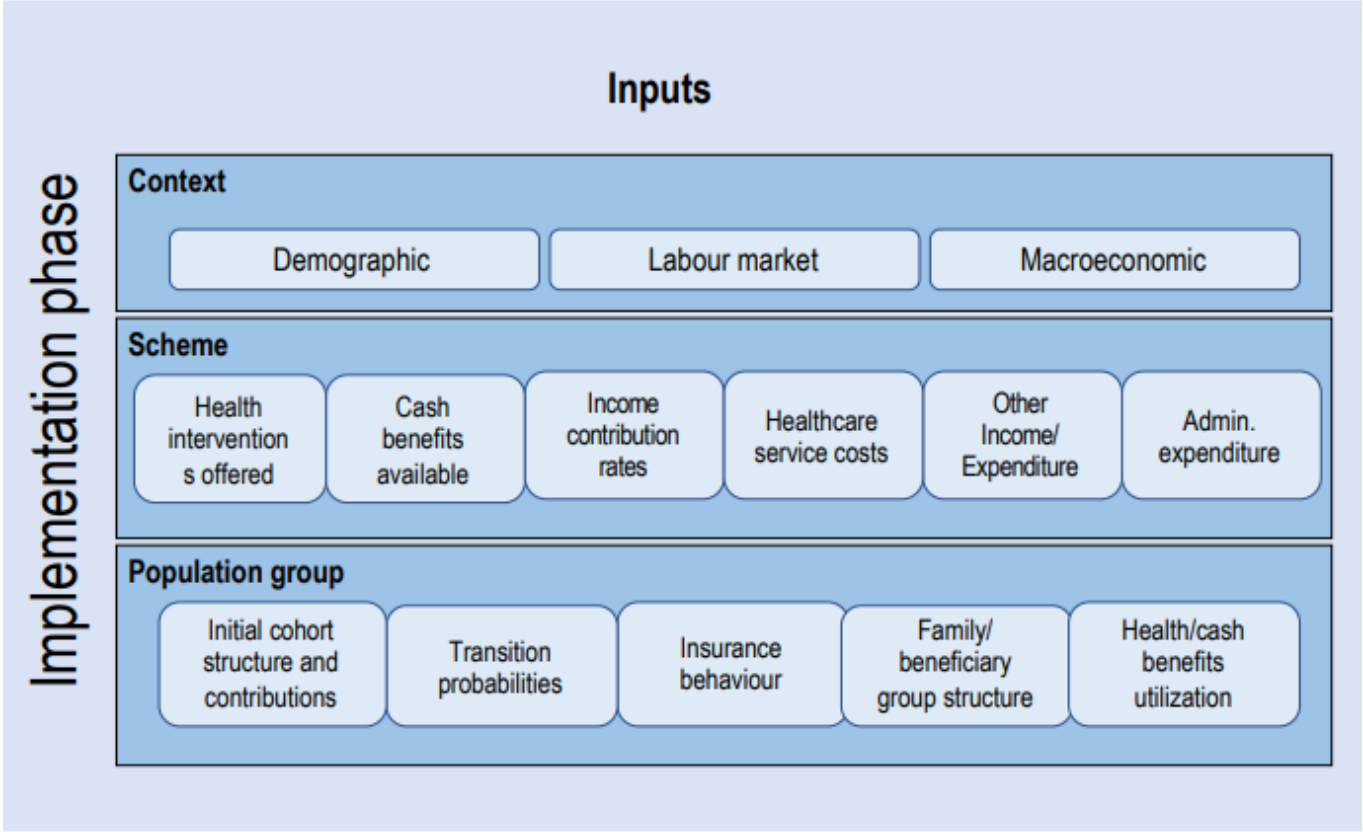
# Implementation phase: Model inputs




## Scheme Inputs:

- A set of rules that determine where scheme revenues come from, level of government transfers/subsidies, who pays contributions, period of contributions and contribution rate, and fees paid by third-party contributors for non-contributory coverage.
- The scheme rules determine the costs of health services, entitlements to cash benefits and health benefit packages, under which conditions and for how long.

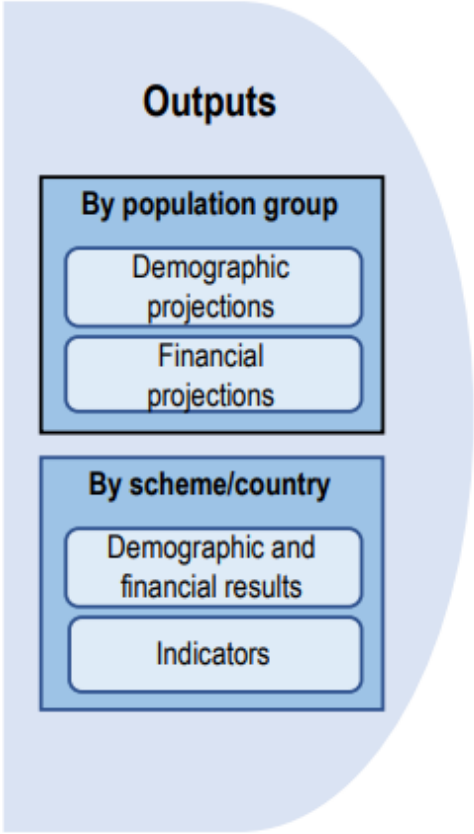
# Implementation phase: Model inputs




## Population Group Inputs:

- Includes the initial composition of the different groups, their different transition probabilities (probabilities of moving between populations groups within the scheme or from the external world), their dependency situation and relevant cash flows such as salaries, payments to health providers, copayments and cash benefits.

# Implementation phase: Model Outputs

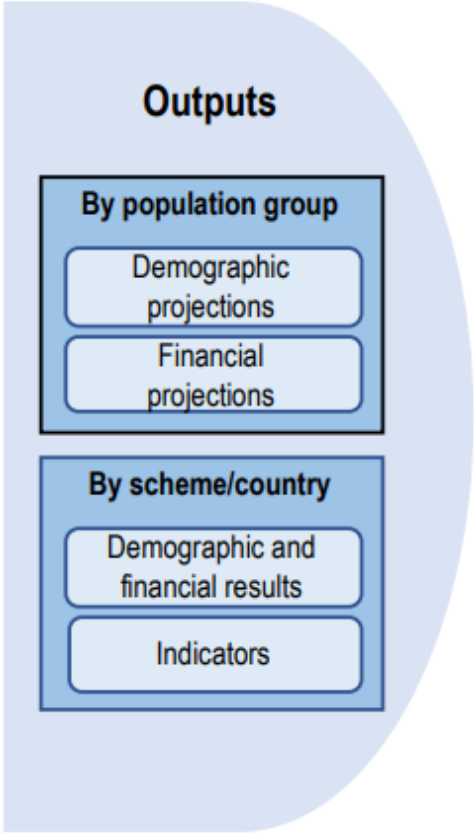



- ILO/HEALTH allows users to generate an extensive set of reports for different uses and needs in terms of analysis and policy design.

- **Two main groups of outputs exist:**
  1. Outputs at population group level (demographic and financial projections), and
  2. Scheme- or country-level outputs.

- All intermediate and final calculation outputs can be displayed, copied and exported from the model (csv or xls), disaggregated by year, age and sex.

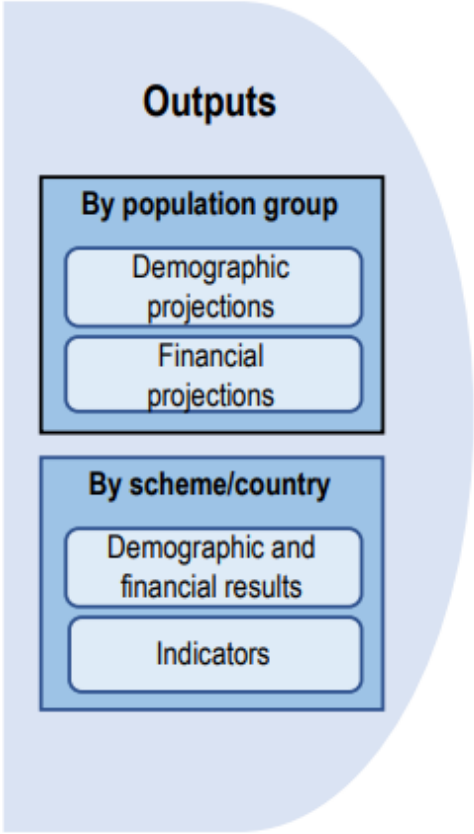
# Implementation phase: Model Outputs




- Demographic and financial projections are generated **as intermediary outputs at the population group level.** These contain average values of salaries, new benefits, total benefits and estimations of the main cash flows associated with each demographic group.

- These demographic and financial projections for each population group are combined with other inputs to enable the model to prepare financial reports **at scheme and country levels.**

# Implementation phase: Model Outputs




- The **final outputs include demographic and financial flows projected in absolute values**, such as directly contributing populations, eligible populations, scheme revenues and expenses, and actuarial technical reserve levels, among others.

- These indicators can be used both to support model calibration and consistency testing and to aid in results analysis and reporting.

# THANK YOU

# Questions?