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Republic of Zambia
Ministry of Labour and Social Security

Actuarial analysis of the National Health Insurance Scheme and costing of the extension of coverage to Social Cash Transfer beneficiaries

Report to the Board of the National Health Insurance Management Authority as of 30 September 2022

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▶ Foreword

This actuarial analysis and costing of the extension of coverage of the National Health Insurance Scheme (NHIS) to Social Cash Transfer (STC) beneficiaries was developed by the National Health Insurance Management Authority (NHIMA) of Zambia with the support of the ILO–EU Global Programme on Improving Synergies between Social Protection and Public Finance Management. At the request of NHIMA, and under the overall coordination of the Ministry of Labour and Social Security (MLSS), this project supported NHIMA in estimating the cost of expanding coverage to STC beneficiaries, in line with Section 16(c) of the National Health Insurance Act, as well as in assessing its impact on the overall financial sustainability of the scheme.

The project aimed at reinforcing NHIMA's internal capacities to monitor the scheme performance and to assess its financial sustainability, with a view to supporting NHIMA's capacity to progress reforms for the extension of coverage. In particular, the project had two main objectives:

- Strengthening internal capacities within NHIMA on scheme performance monitoring, data collection for actuarial analysis and actuarial modelling processes and outputs.
- Quantifying the cost of expanding social health insurance coverage to SCT beneficiaries on a non-contributory basis, as well as its impact on the overall financial sustainability of the scheme, and recommendations thereto.

This report synthesizes the main results of the project and provides recommendations for action. It is hoped that the project results contribute to the extension of coverage of the NHIS and support NHIMA's operational objectives to give effect to the National Health Insurance Act of 2018.

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▶ Abbreviations and acronyms

Act	National Health Insurance Act No. 2 2018
Act Ins	active insured population
BoZ	Bank of Zambia
COMESA	Common Market for Eastern and Southern Africa
CT	computerized tomography
DALYs	disability-adjusted life years
DoB	date of birth
DRGs	Diagnosis Related Grouping
ENT	ear, nose and throat
FSP	Food Security Pack
GDP	gross domestic product
HIV	human-immunodeficiency virus
HPCZ	Health Professions Council of Zambia
ICT	information and communications technology
ICU	intensive care unit
ID	scheme identifier
ILO	International Labour Office/Organization
ILO/HEALTH	ILO Actuarial Health Model
ILO STAT	International Labour Organization Labour Statistics Database
IMF	International Monetary Fund
IOM	International Organization for Migration
IPD	Inpatient Department
ISAP	International Standards of Actuarial Practice
ISSA	International Social Security Association
K	Kwacha (Zambia currency)
LESS	Livelihood Empowerment and Support Scheme
LF	employed labour force
LFS	Labour Force Survey
MCDSS	Ministry of Community Development and Social Services
MLSS	Ministry of Labour and Social Security
MRI	magnetic resonance imaging
NAPSA	National Pension Scheme Authority
NHIF	National Health Insurance Fund
NHIMA	National Health Insurance Management Authority
NHIS	National Health Insurance Scheme
OPD	Outpatient Department

PAYG	Pay-as-you-go
PPMs	provider payment methods
PWAS	Public Welfare Assistance Scheme
SCT	Social Cash Transfer
SGBV	sexual and gender-based violence
SI 63	National Health Insurance (General) Regulations 2019
SLA	service level agreement
SOCPRO	ILO Social Protection Department
SOCPRO/ASU	ILO Actuarial Services Unit
SOCPRO/PFACTS	ILO Public Finance, Actuarial and Statistics Unit
SOCPRO/POLICY	ILO Social Policy Unit
TB	tuberculosis
Total Ins	total insured population
TP	total population
TPAs	third-party administrators
UHC	universal health coverage
UN	United Nations
WEO	*World Economic Outlook*
WB	World Bank
ZamStats	Zambia Statistics Agency
ZMW	ISO Code for Zambian Kwacha
ZISPIS	Zambia Integrated Social Protection Information System
ZSIC	Zambia State Insurance Company Life Limited

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The project was delivered under the coordination of the Research and Planning Department of NHIMA, represented by Herryman Moono (Director – Research and Planning) and Fred Chitalu (Specialist – Monitoring and Evaluation), with executive management support from Tontela Siwale (Director – Health Insurance Services), and Director General, Michael Njapau.

A multi-disciplinary NHIMA project team representing Finance and Investments (Muliokela David Wakunuma and Gilbert Chifumbe Sikazwe), Health Insurance Services (Owen Sichilima, Michael Musonda Zimba, and Suwilanji Nawila), Information Technology (Miyanda L. Sichone) and Quality Assurance and Accreditation (Alex Lwando) was constituted to ensure the delivery of verified scheme data. This team was complemented by the Ministry of Labour and Social Security (MLSS) (Victor Chikalanga – Deputy Director Social Security, and Eugene Walusiku – Social Security Officer) and the Ministry of Community Development and Social Services (MCDSS) (Andrew Kashoka – Assistant Director ICT, and Lubasi Musambo – ICT).

This project would not have been possible without the technical and administrative support of Anthony Dumingu (Director Social Security – MLSS) and Marta Palmarola Adrados (Manager SGBV and Social Protection Sector – Delegation of the European Union to the Republic of Zambia and COMESA).

The ILO team supporting the project and the development of the report included (in alphabetical order): Andres Acuna-Ulate (ILO Geneva, SOCPRO/PFACTS), Kagisanyo Kelobang (ILO Geneva, SOCPRO/PFACTS), Jean-Louis Lambeau (ILO Lusaka), Cristina Lloret (ILO Geneva, SOCPRO/ASU), Mathilde Mailfert (ILO Geneva, SOCPRO/POLICY), Michael Mannasseh Mhando (external collaborator), Felix Mwenge (ILO Lusaka), Nanya Sudhir (ILO Geneva, SOCPRO/PFACTS), and Esther Tafela (ILO Lusaka). The overall technical supervision of the report was assumed by Helmut Schwarzer (ILO Geneva, SOCPRO/PFACTS) and benefited from the review and inputs of Christina Behrendt (ILO Geneva, SOCPRO/POLICY), Lou Tessier (ILO Geneva, SOCPRO/POLICY) and Hiroshi Yamabana (ILO Geneva, SOCPRO/PFACTS). The project is grateful for the management support of Wellington Chibebe (ILO Lusaka, Director) and Shahrashoub Razavi (ILO Geneva, SOCPRO Director).

Executive summary

The National Health Insurance Act No. 2 of 2018 (henceforth the Act), as per Section 5(s), requires the National Health Insurance Scheme (NHIS) to undertake periodic actuarial assessments to ensure the prudent administration and financial sustainability of the scheme. This report presents an actuarial assessment of the NHIS as of 30 September 2022, with projections spanning a 10-year period from 2023 to 2032. It further undertakes a preliminary costing analysis of extending the scheme to the "poor and vulnerable" in line with Section 16(c) of the Act. For application purposes, the term "poor and vulnerable" as defined in the Act, has been interpreted to mean participants in the national Social Cash Transfer (SCT) programme.

This exercise was conducted by the Research and Planning Department of the National Health Insurance Management Authority (NHIMA) with support from the International Labour Office (ILO). For modelling future income and expenditure, the ILO/HEALTH actuarial model was used. The ILO/HEALTH Model is an online, computer-based projection and simulation tool developed by the Social Protection Department of the ILO.[1]

This actuarial analysis exercise has been done in accordance with International Standards of Actuarial Practice (ISAP) 1 and 2,[2] as well as the International Labour Organization and International Social Security Association (ISSA) Guidelines on Actuarial Work for Social Security.[3] As a reference to the actuarial analysis, an overview of the legal framework within which the NHIS operates is shown in Appendix 1.

Data requirements and quality

The ILO/HEALTH Model is a versatile tool whose calibration can accommodate the unique characteristics of social health insurance scheme design (including contributory and non-contributory elements, benefits package design, provider payment methods and diverse eligibility criteria). Like any actuarial tool, the ILO/HEALTH Model is calibrated using a vast array of input data that needs to be sufficient and reliable. The actuarial analysis exercise is highly reliant on adequate monitoring and routine collection of historical data regarding the insured population (by sex, age, employment/income status), revenues from contributions and state transfers, administrative costs and expenditure from claims. Without accurate information in this respect, the model needs to rely on assumptions that may induce uncertainty on the results.

The application of the ILO/HEALTH Model requires extensive inputs with respect to scheme-specific data on membership and contribution income, as well as health benefit and administrative expenditure.

These NHIS-specific data inputs were complemented by national demographic, labour force and economic data which provide the context in which the scheme operates. This actuarial analysis exercise benefited from significant investments by NHIMA to gather and consolidate the requisite administrative data, financial statements and governance reviews required to meet the input requirements of the ILO/HEALTH Model.

The extensive efforts deployed to compile NHIS data for the purpose of the actuarial analysis exercise show that there are still important systemic changes that NHIMA should make to improve the availability and sufficiency of data for monitoring and decision-making purposes. The review of NHIMA's contractual

[1] For more information, see https://qpss.ilo.org/ and https://www.social-protection.org/gimi/gess/ShowRessource.action;jsessionid=ylgQ3TbkSJBQEMJ7KVhXLmTFJcn6-iO92RE41i95QOhRbunCNQEY!445242879?id=56887.

[2] https://www.actuaries.org/iaa/IAA/Publications/ISAPs/IAA/Publications/05ISAPs.aspx?hkey=334b21a7-a3ac-4e0e-8294-3cbc755ab14a.

[3] ISSA and ILO, *Guidelines on Actuarial Work for Social Security*, 2022. https://ww1.issa.int/system/files/documents/2022-10/2-Guidelines%20ACT-2022.pdf.

arrangements with its Third-Party Administrators should be a first step to ensure that the data warehousing arrangements do not stand in the way of the scheme's performance monitoring needs. There is need to develop an NHIS dashboard containing key performance indicators related to the (i) covered population and prospective participants (contributory and non-contributory, dependants, etc.); (ii) the Benefit Package (demand for services, utilization rates, and the unit cost of health care interventions); (iii) financing sources (contributions from members and their employers, transfers from the Government, etc.); and (iv) administrative expenditure. This dashboard would provide a basis to inform the day-to-day management of the scheme, as well as to identify areas where additional analysis is needed to secure a robust data repository for further actuarial analysis and the mitigation of risks related to adverse selection, cost escalation and fraud.

A significant data deficit that has not yet been overcome is the limited registration of NHIS dependants. Despite not being registered, the dependants of NHIS active primary members remain entitled to health services as and when requested. An age and sex profile of these unregistered dependants is critical to projecting the future demand and consumption of NHIS health services. The available NHIS dependant registry constitutes less than 10 per cent of the dependent population. As such, the profile of registered NHIS dependants was developed using national population age-profile assumptions to serve as proxy for the unregistered NHIS dependent population.

Continued efforts are needed to improve the NHIS capacity to register the insured population and monitor the ongoing performance of the scheme.

NHIS membership and revenues

The current membership of the NHIS is categorized into four distinct groups, namely: (i) formal sector *employees in the public sector*; (ii) formal sector *employees in the private sector*; (iii) *self-employed workers*[4]; and (iv) *pensioners* and "*older*[5] *persons above the age of 65"*. The prescribed contribution rates are 2 per cent of basic earnings for employees in the public and private sectors, and 1 per cent of declared earnings for self-employed workers, whilst pensioners and older persons are exempted from contributing to the NHIS.

The initial focus of the actuarial analysis exercise was to examine the NHIS active membership records to consider the contributory income capacity of the scheme, as well the profile of the beneficiary population entitled to receive health services. This exercise interrogated the NHIS database to complete missing membership details, remove duplicates, and update the records of those members who had exited or were no longer contributing to the NHIS, as well as to characterize the data by age, sex, and substantive membership group.

[4] The terminology used to describe the NHIS membership groups is slightly different from internationally accepted nomenclature that is considered conducive to fostering transitions from the informal to the formal economy. The NHIS membership group referring to *employees in the private sector* refers specifically to formal-sector workers whose economic activities are not under direct state control, whilst *self-employed workers* includes both wage and own-account workers in the informal economy. It is worth noting that the NHI Act makes reference to *employees* and *self-employed workers*, without distinguishing whether they are in the formal or informal economy. From the ILO perspective, employment in the private sector encompasses both employees in registered enterprises (formal sector) and workers in informal economic units (informal sector). Among those working in the informal sector, some are self-employed (including own-account workers) and others are in wage employment, working for an employer. Informal employment includes those working in the informal sector, as well as informal workers in the formal sector, such as undeclared workers. See *ILO, Women and Men in the Informal Economy: A Statistical Update*, 2023.

[5] The NHI Act makes use of the term "*elderly*". The ideal reference is "*older persons",* which has been maintained in this text for consistency and ease of reference. *Pensioners* have been included to this group as they are also eligible for non-contributory participation irrespective of age (includes persons who are in receipt of invalidity pensions or early retirees (eligibility starts at age 55) and normal retirement (eligibility starts at age 60) pensions.

The largest variance noted between the NHIS cumulative membership records and the confirmed active members was with respect to self-employed workers. The NHIS records indicated a cumulative total of 785,435 registered self-employed workers, against a confirmed active membership status of 220,052 (a 72 per cent reduction, indicating that only 28 per cent of registered self-employed workers are actively contributing to the scheme). In comparison, employees in the formal sector (public and private) exhibited a 7 per cent reduction (indicating that 93 per cent of the registered formal sector workers are actively contributing). The substantial difference between the number of registered versus actively contributing self-employed workers is indicative of the trend by this group to register and pay NHIS contributions only when in need of medical services, and subsequently discontinue contribution payments once the required medical services have been accessed. It is worth highlighting that self-employed workers (and their dependants) have the highest NHIS average cost per claim at 336.83 Kwacha (ZMW), against a scheme average of 299.03 Kwacha per claim. These observed traits expose the NHIS to adverse selection risk from the self-employed population, which puts additional pressure on the financial sustainability of the NHIS. Whilst self-employed workers currently register with the NHIS on a voluntary basis, actually their affiliation to the scheme is mandatory by law.

It is important for NHIMA to adopt a proactive registration and contribution collection strategy with adequate compliance checks with respect to the self-employed workers.

To consider the contribution income projections of the NHIS, an analysis of the age-specific earnings profile of each contributor group was considered and projected forward at earnings growth rates derived from the national and scheme-specific experience. From this analysis, the average NHIS monthly contribution is approximately 100 Kwacha per registered formal (public and private) sector employee, whilst self-employed workers on average contribute 10 Kwacha per month.

The future growth prospects of the NHIS contributory membership are projected to emanate largely from the self-employed workforce which constitutes 70 per cent of Zambia's labour force.[6] The self-employed membership growth projection was reaffirmed by the NHIMA Strategic Plan (2023–2026).[7] Conservative estimates were applied to the prospective coverage growth rates for the private and public sectors as the 2021 Labour Force Survey Report indicates that the NHIS has effectively registered 90 per cent of the employees in these sectors. Against this increased contributory coverage, driven primarily by the self-employed, total NHIS coverage (inclusive of member dependants) is anticipated to grow from 6.7 million in 2023 to 15.2 million in 2032, whilst the NHIS contribution income is projected to increase from 1.2 billion Kwacha in 2023 to 2.6 billion Kwacha in 2032.

It is recommended to move towards a proactive registration strategy to implement the mandatory coverage prescribed in the law and adapt registration and contribution collection modalities for those in the informal sector, especially the self-employed. Similarly, moving to a household-based enrolment procedure will allow registration of all beneficiaries, including the principal member and all eligible dependants, at one time – and thus extend the scheme's coverage more rapidly in line with the Act of 2018.

NHIS claims analysis and modelling

To profile the NHIS claims experience, data were collated against the 35 health service groups through which the NHIMA Benefit Package is delivered. The claims data analysed covered the period 1 January 2021 to 30 September 2022. This period of analysis was adopted to benefit from the NHIS's most recent, comprehensive, and consistent claims data sets, made available after the data cleaning exercise by NHIMA. Earlier claims data

[6] MLSS, *2021 Labour Force Survey Report*, 2022. https://www.zamstats.gov.zm/wp-content/uploads/2023/05/2021-Labour-Force-Survey-NHPP.pdf.

[7] NHIMA, "Strategic Plan (2023–2026): Social Health Protection Financing for Universal Health Coverage", 2023. https://www.nhima.co.zm/download/document/6e0fa33fe6202303026b0a19cc.pdf.

(prior to 1 January 2021) were not taken into account as they were compiled manually and were inconsistent with more recent records. This is reflective of the limited information and communications technology (ICT) capacities during NHIMA's formative stages.

The NHIMA claims experience of each of the 35 health service groups was utilized to model intervention-specific utilization rates and associated unit costs, disaggregated by age, sex, and membership group of the claimants. Unique utilization growth hypotheses were developed for each intervention, with the input of the NHIMA Quality Assurance & Accreditation and Health Insurance Services Units. In projecting the evolution of unit costs against each of the health service groups, cognizance was taken of the prospective impact of inflation, as well as the increasing preference for private health providers which was also noted as a cost driver. With less than two full years of claims history, it is difficult to make reliable long-term assumptions on future utilization and medical cost inflation trends. A strong claims monitoring system needs to be put in place to support the follow-up actuarial reviews of the scheme to improve these assumptions.

Given the rapidly evolving NHIS income and expenditure profile, it is recommended that an actuarial valuation be undertaken annually, to consider the impact of operative reforms and improvements in data quality.

NHIS baseline scenario: Sustainability projections

To assess the financial sustainability of the NHIS in its current form, a baseline projection of the expected income and expenditure experience for the period 2023 to 2032 was progressed based on the input data available. This projection was premised on the current membership and earnings/contribution profile, adjusted for coverage extension largely driven by the increased enrolment of self-employed workers, as well as earnings growth assumptions. Table ES1 presents the results of the baseline NHIS income and expenditure projections.

Table ES1. NHIS baseline income and expenditure projections (in Kwacha millions)

Year	Contribution income	Investment income	Benefits expenditure	Administration expenditure	Other expenditure	Net income
2023	1 198	280	1 081	108	160	128
2024	1 344	267	1 509	151	160	-210
2025	1 486	223	1 855	185	160	-491
2026	1 645	156	2 226	223	120	-768
2027	1 817	65	2 634	263	120	-1 135
2028	1 986	0	3 026	303	120	-1 463
2029	2 142	0	3 450	345	80	-1 734
2030	2 310	0	3 899	390	80	-2 060
2031	2 484	0	4 386	439	80	-2 421
2032	2 673	0	4 914	491	40	-2 773

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

In 2023, it is expected that the NHIS will collect 1.2 billion Kwacha in contribution income, as well as 0.28 billion Kwacha from investment income realized against its accumulated technical reserves. In contrast, the NHIS 2023 health services benefit expenditure is expected to be marginally lower at 1.1 billion Kwacha. As a consequence, the NHIS is expected to realize a marginal operating surplus of 0.1 billion as at end of 2023, taking into account the additional administration and ICT-related costs.

From 2024 onwards, the NHIS is expected to start realizing an increasing operating deficit and would be forced to use its reserves to meet the ever-increasing gap between its income and expenditure.

It is worth noting that the liquidation of NHIS reserves is already being undertaken to counter the liquidity mismatch between contribution income and health expenditure benefit payments, a clear signal that the scheme is under financial duress. These investment reserves, currently valued at 1.5 billion Kwacha (as of 30 September 2022) are expected to be completely exhausted by 2028, unless corrective action is taken.

From this analysis, it is noted that the NHIS health benefits expenditure is increasing faster than contribution income; consequently the scheme is not financially sustainable unless corrective action is taken now.

The corrective action simulated in the actuarial analysis exercise was to consider options to increase the contribution income of the NHIS. Scenarios to consider prospective changes to the NHIS health expenditure experience through adjustments to the NHIS Benefit Package and cost structure were not considered. It would be important in future to consider and simulate prospective reforms that curb excessive consumption of health services and high medical cost increases, to ensure that the NHIS facilitates optimal access to needed services at the best value for money.

It is recommended that a careful analysis of the existing NHIS Benefit Package be conducted to inform prospective reforms that rationalize its composition and ensure financial sustainability.

This actuarial analysis exercise did indicate areas for administrative reform with respect to the provision of dental and optical health services, which have since been implemented by NHIMA.

NHIS contribution rate adjustment: Sustainability projections

The next phase of the actuarial analysis exercise was to consider the quantum of contributory income increases required to attain an operational balance of the NHIS. NHIMA, having noted the inconsistent contribution profile of the self-employed workers, and their voluntary association with the NHIS, is sceptical of basing the income growth prospect on this group. Therefore, NHIMA decided that the modelled income contribution adjustments would be premised on the formal-sector employees from the public and private sector membership only. It is crucial for NHIMA to urgently address the volatile contribution experience with respect to self-employed workers and adjust future actuarial projections accordingly.

The first iteration considered was a revision of the contribution structure applied to formal (public and private) sector employees from 2 to 3 per cent of basic earnings, effective in 2025. The proposed 3 per cent contribution rate adjustment is able to outpace the NHIS expenditure for a short period only (2025 and 2026), after which the scheme again realizes an operating deficit with the NHIS reserves completely drawn down by 2030.

The next iteration was to consider the impact of a cumulative contribution rate increase to 4 per cent of basic earnings in respect of formal (public and private) sector employees, again applied from 2025 onwards. The impact of this adjustment on the income and expenditure balance sheet of the NHIS is presented in table ES2.

Table ES2. NHIS income and expenditure projections at 4 per cent formal sector contribution rate (in Kwacha millions)

Year	Contribution income	Investment income	Benefits expenditure	Administration expenditure	Other expenditure	Net income
2023	1 198	280	1 081	108	160	128
2024	1 344	267	1 509	151	160	-210
2025	2 880	299	1 855	185	160	978
2026	3 168	402	2 226	223	120	1 001
2027	3 483	515	2 634	263	120	981
2028	3 792	622	3 026	303	120	965
2029	4 076	724	3 450	345	80	924
2030	4 383	820	3 899	390	80	833
2031	4 705	903	4 386	439	80	703
2032	5 055	971	4 914	491	40	580

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

A review of the modelled NHIS income and expenditure experience sees the 4 per cent formal sector contribution rate against basic earnings as sufficient to maintain the medium-term sustainability of the NHIS.

The NHIS is a short-term scheme financed on a pay-as-you-go (PAYG) framework and is not expected to accumulate excessive technical reserves. The reserves should be sufficient only to cushion the scheme against short-term shocks, allowing it time to adjust and take corrective action to regain financial sustainability. The size of the reserves is usually measured with reference to the total annual expenditure of the scheme, a comparison which is referred to as a *funding ratio.* A funding ratio of one (1) is indicative of the capacity of the NHIS to meet the health expenditure benefit obligations for one year, outside of any income being received. *The target funding ratio of health insurance schemes depends upon numerous factors, including the size of the scheme, the experienced stability (depth of historic operational data) of its benefit expenditure, and the realistic period within which a contribution rate change can be effected. The funding ratio of health schemes typically varies between a coefficient of 0.25 and 1, or even higher.*[8]

Where the scheme is still in its formative stages (such as the NHIS) it is expected to exhibit high expenditure growth driven by changing utilization and health consumption patterns; as such, a higher funding ratio coefficient is warranted.

A 4 per cent contribution rate revision sees the NHIS funding ratio peaking at 1.35 in 2029, with a gradual subsequent decrease, a characteristic which is well in the range of best practice operative norms of social health insurance schemes (table ES3).

[8] Michael Cichon et al., *Modelling in Health Care Finance: A Compendium of Quantitative Techniques for Health Care Financing* (Geneva: ILO, 1999). https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---soc_sec/documents/publication/wcms_209903.pdf.

Table ES3. NHIS reserve coefficient at 4 per cent contribution rate for employees in the formal (public and private) sector

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Funding ratio	1.14	0.67	0.94	1.14	1.25	1.32	1.35	1.34	1.28	1.21

Source: NHIMA ILO/HEALTH Model – [RPT_TFR] Table Financial Results.

This analysis reinforces the conclusion that the modelled 4 per cent contribution rate delivers medium-term sustainability of the NHIS and does not foster the accumulation of excessive reserves.

A simulated increase in contributions from the formal sector to 4 per cent of basic earnings revealed the minimum necessary to secure medium-term sustainability of the NHIS under the current scheme design and operations.

To maintain an operative balance, the NHIS must also look at avenues to control expenditure growth. The cumulative impact of complementary income and expenditure outcomes is necessary for the financial sustainability of the scheme.

Considering the additional costs of including SCT recipients in the NHIS

The NHIS is required by Section 16(c) of the Act to extend non-contributory coverage to the *poor and vulnerable*, which has been interpreted to mean the participants of the Social Cash Transfer (SCT) scheme as administered by the Ministry of Community Development and Social Services (MCDSS). The next phase of the actuarial exercise was to consider the additional funding required for this coverage extension. A policy dialogue is required to consider the detailed implementation modalities and possible funding options to meet this additional financial commitment.

The total number of SCT participants has recently exceeded one million and is expected to peak at 1.4 million by 2032. Consistent with other membership categories, participation of the SCT membership would also be extended to their families, as per standing NHIS rules – i.e. one spouse and up to five dependent children under age 18. This will have the impact of increasing the NHIS participation to 85 per cent of the national population by 2032, a significant progress towards the universal health coverage (UHC) agenda.

For practical purposes, the NHIS is unable to on-board all the recipients of the SCT in a single exercise, and as such NHIMA proposes a phased on-boarding of 10 per cent of participants per year, as per the schedule shown in table ES4. The phased on-boarding schedule was factored into the actuarial costing exercise. It is recommended that an implementation plan be developed to flesh out the operational modalities for the extension of coverage to this group, as well as to consider which SCT participants are prioritized for initial on-boarding.

▶ Table ES4. Proposed SCT on-boarding schedule

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
% SCT recipients on NHIS	10.0%	20.0%	30.0%	40.0%	50.0%	60.0%	70.0%	80.0%	90.0%	100.0%
Total number of SCT recipients on NHIS	137 450	274 900	412 350	549 800	687 250	824 700	962 150	1 099 600	1 237 050	1 374 500

Sources: NHIS/MCDSS data and author calculations.

The anticipated health benefit costs of the SCT recipients were determined against this phased on-boarding schedule and premised on the observed NHIS utilization rates (specifically the self-employed population), against the modelled interventions. The available national data was not well aligned with the modelled interventions, and inconclusive on the general health utilization rates of the poor and vulnerable as encompassed in the NHIMA health package.

At the request of NHIMA, the costing was progressed under two different assumptions: (scenario 1) that SCT recipients would have full entitlements to the NHIS Benefit Package, but would be able to access services from public health facilities only; and (scenario 2) that SCT recipients would be at par with the currently covered population groups in every aspect (i.e. full entitlement to the NHIS Benefit Package, with services accessible from both public and private health facilities). Table ES5 presents the estimated health expenditure benefit costs of SCT coverage (excluding administrative costs).

▶ Table ES5. Modelling of SCT coverage and health expenditure costs (in Kwacha)

Year	No. of SCT households	Total no. of SCT beneficiaries	Scenario 1: Expenditure against public health facilities only	Scenario 2: Expenditure against private and public health facilities
2023	137 450	578 580	51 257 314	74 056 316
2024	274 900	1 202 290	126 594 055	184 102 782
2025	412 350	1 873 768	213 116 045	306 353 791
2026	549 800	2 595 794	313 099 329	449 410 486
2027	687 250	3 371 287	428 889 804	615 207 669
2028	824 700	4 203 321	562 352 975	807 005 802
2029	962 150	5 095 125	716 318 822	1 028 187 630
2030	1 099 600	6 050 097	893 465 620	1 282 607 228
2031	1 237 050	7 071 807	1 096 661 251	1 574 278 912
2032	1 374 500	8 164 009	1 329 393 383	1 908 355 829

Sources: NHIS data and author calculations

The health expenditure costs related to SCT participants and their households is targeted to reach 1.3 billion Kwacha in 2032 against scenario 1, and 1.9 billion Kwacha under scenario 2.

Given that the NHIS is already under financial strain with its current membership, the on-boarding of SCT households will require additional funding from government transfers and or external grants. The cost differential between scenarios 1 and 2 indicates that NHIMA needs to apply strategic purchasing methods with respect to private health providers to secure services on a value for money basis, thus enabling the scheme to reach universal population coverage in a financially sustainable fashion.

Against the SCT health benefit expenditure projections, it is important for NHIMA to assess the cost of carry per household. The annual health expenditure was therefore assessed against the projected number of registered SCT households to yield the expected annual cost per household, which was subsequently translated to a monthly rate. The monthly SCT cost of carry per household was determined against scenario 1 and scenario 2, and duly referenced against the costs determined for the existing contributory membership groups, for validity testing (table ES6).

Table ES6. Comparative table of the average monthly benefit costs of select NHIS membership groups (in Kwacha)

	Public sector employees	Private sector employees	Self-employed workers	SCT Scenario 1	SCT Scenario 2
2023	48.9	52.9	58.1	**29.6**	**44.9**
2024	58.2	63.9	69.3	**36.5**	**55.8**
2025	62.2	68.6	74.6	**41.0**	**61.9**
2026	66.0	72.9	79.6	**45.2**	**68.1**
2027	69.6	77.1	84.5	**49.5**	**74.6**
2028	73.4	81.4	89.4	**54.1**	**81.5**
2029	77.3	85.8	94.3	**59.1**	**89.1**
2030	81.3	90.3	99.4	**64.5**	**97.2**
2031	85.4	94.9	104.7	**70.4**	**106.1**
2032	89.7	99.8	110.1	**76.8**	**115.7**

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

This outcome yields the monthly subsidy per SCT household that needs to be financed through tax revenue and or external grants to meet the additional NHIMA health benefit funding costs, consistent with this extension of coverage to the poor and vulnerable.

This actuarial analysis exercise did not consider revisions to the NHIMA Benefit Package. It is however expected that the NHIS product offering will evolve over time to improve product relevance and cost containment mechanisms. The efficiency of NHIS administrative operations is another key variable to support the financial sustainability of the scheme. This requires the harnessing of requisite ICT capacities to minimize operational costs, as well as to improve the NHIMA data management, analytics and performance monitoring capabilities. This actuarial analysis exercise is a positive step in that direction.

1. Demographic and macroeconomic environment of Zambia

The actuarial analysis of the NHIS began by considering the general macroeconomic environment and demographic trends within which the scheme operates. This context has a bearing on how the NHIS system will evolve.

This review also considered the formulation of the demographic and macroeconomic assumptions to be applied in the actuarial analysis exercise. The demographic and macroeconomic projections are closely linked and are therefore carried out together to ensure their consistency. They are based on an analysis of recent trends, and a plausible estimate of future developments. A projection horizon of 10 years (2023 to 2032) has been applied to consider the NHIS evolution over this period.

The data considered for this analysis have been primarily based on data from the Zambia Statistics Agency (ZamStats), and the Bank of Zambia (BoZ), with additional information sourced from the United Nations (UN) Department of Economic and Social Affairs Population Division, the International Monetary Fund (IMF) *World Economic Outlook* (WEO), the World Bank (WB) Data Catalogue, and the International Labour Organization (ILO) Labour Statistics Database (ILO STAT).

1.1. Demographic profile

The analysis of the Zambia general population is used as a reference to consider the evolution of the scheme's membership and effective coverage. Population projections require specific assumptions on fertility, migration and mortality. These are important inputs to the demographic and financial projections of the NHIS. The general population projections, and the related assumptions, will have an impact on the projected participation in the scheme, an important reference against the NHIS mandate.

1.1.1. Initial population and growth prospects

The actuarial analysis exercise benefited from the release of the Zambia "2022 Census of Population and Housing: Preliminary Report",[1] published in December 2022. This census report provided the base scenario of the gross population and the latest evidenced growth trends in Zambia. According to the report, the Zambia population was 19,610,769 as at September 2022, this study's baseline date. This population was constituted of 9,603,056 males and 10,007,713 females. The male population growth rate was estimated at 3.4 per cent annually between 2010 and 2022, while the female population grew at 3.5 per cent annually over the same period. *These population and sex-aggregated growth rates were utilized to progress the population growth rate assumptions over the projection period 2023 to 2032*. Table 1.1 provides an overview of how the Zambia population is projected to grow over the analysis period.

[1] ZamStats, "2022 Census of Population and Housing: Preliminary Report", 2022. https://www.zamstats.gov.zm/wp-content/uploads/2023/05/2022-Census-of-Population-and-Housing-Preliminary.pdf.

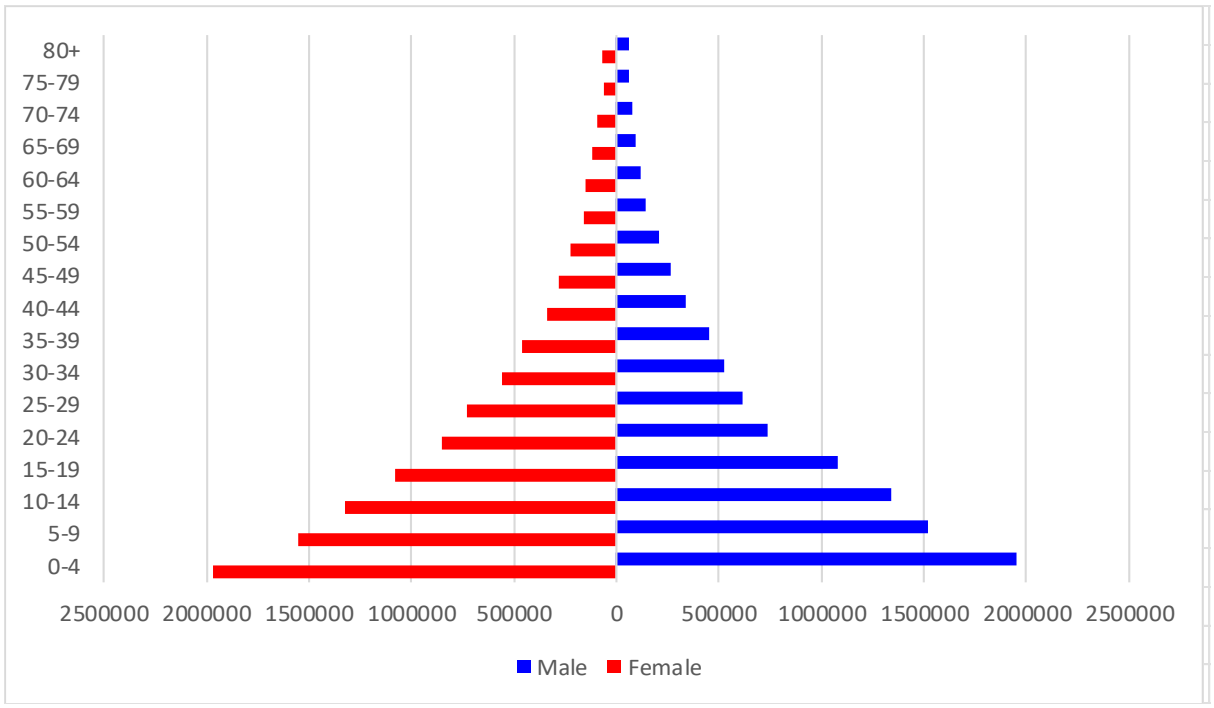
Table 1.1. Zambia national population projections

Year	Male	Female	Total
2022	9 603 056	10 007 713	19 610 769
2023	9 929 560	10 357 983	20 287 543
2024	10 267 165	10 720 512	20 987 677
2025	10 616 249	11 095 730	21 711 979
2026	10 977 201	11 484 081	22 461 282
2027	11 350 426	11 886 024	23 236 450
2028	11 736 340	12 302 035	24 038 375
2029	12 135 376	12 732 606	24 867 982
2030	12 547 979	13 178 247	25 726 226
2031	12 974 610	13 639 486	26 614 096
2032	13 415 747	14 116 868	27 532 615

Sources: ZamStats, "2022 Census of Population and Housing: Preliminary Report", and author calculations.

The 2022 census report did not provide an age-specific population profile, which is a key attribute required to progress the actuarial analysis exercise. To augment this deficit, the age-specific population profile of the Zambia 2010 census was applied to the 2022 data set. This 2010 age-specific profile, also produced by ZamStats, was preferred over alternate age-specific profiles as prepared by the UN Population Division and other international data platforms, to ensure consistency of the enumeration methodology. A review of this outcome against the alternative international data platforms indicated a general conformity, albeit with differing gross population base estimates. Figure 1.1 presents a visualization of the Zambia population, grouped in five-year age bands.

Figure 1.1. Population pyramid of the 2022 Zambia national population, in five-year age bands



Sources: ZamStats, "2022 Census of Population and Housing: Preliminary Report" and author calculations.

1.1.2. Fertility

The Zambia population realized an annual growth rate of 3.4 per cent in the 2010–22 intercensal period. This is higher than the annual growth rate of 2.8 per cent realized over the 2000–2010 period, and the 2.4 per cent recorded over 1990–2000. The observed increase of the population growth rates presents an interesting outcome, as the total fertility rate for Zambia has dropped from 5.9 in 2010 to 4.2 in 2022 (as per ZamStats[2] and UN Population Division[3] data). The population growth rate increases can possibly be attributed to improvements in the health and socio-economic environment, as well as enhancements to the census survey methodology with Zambia conducting its first E-census in 2022. It is in this context that the 2022 census population growth rates of 3.4 per cent (males) and 3.5 per cent (females) were adopted as input assumptions for the projection period, despite contrary (and more optimistic) reduced growth estimates from the UN (which transitioned from 2.72 per cent in 2023 to 2.4 per cent in 2032).[4]

1.1.3. Migration

A review of the Zambian net international migration trends, with due reference to the International Organization for Migration (IOM)[5] and the UN Population Division[6] indicates trends of 9,000 and 5,000 respectively, which represent below 0.05 per cent of the national population. As a result, international migration patterns were not considered to have a significant impact on the population growth prospects, and consequently on the actuarial analysis outcomes.

1.1.4. Mortality

In the absence of fully-fledged Zambian life tables, the age-specific mortality rates applied to the actuarial analysis exercise have been determined from the UN Population Division's "Model Life Tables", specifically the MLT _UN2011_130_1y.[7] This output was duly referenced against the abridged life tables as contained in the 2010 Census to confirm a general consistency.

[2] ZamStats, "2010 Census of Population & Housing: National Analytical Report".

[3] UN Population Division, "Total Fertility Rate Projections". https://population.un.org/dataportal/data/indicators/19/locations/894/start/2022/end/2032/table/pivotbylocation.

[4] UN Population Division, "Population Growth Rate Projections". https://population.un.org/dataportal/data/indicators/51/locations/894/start/2022/end/2032/table/pivotbylocation.

[5] IOM, "Migration Data Portal". https://www.migrationdataportal.org/international-data?i=netnumbermig&t=2021&cm49=894.

[6] UN Population Division, "Net Migration Projections". https://population.un.org/dataportal/data/indicators/65/locations/894/start/2022/end/2023/table/pivotbylocation.

[7] UN Population Division, "Model Life Tables". https://population.un.org/wpp/Download/Standard?Mortality/.

Table 1.2. Sample of Zambia mortality rates, selected ages and years

Age	Male				Female			
	2021	2025	2030	2032	2021	2025	2030	2032
0	0.04789	0.03005	0.01678	0.04434	0.04818	0.01857	0.00564	0.05325
5	0.00134	0.00072	0.00034	0.00116	0.00166	0.00044	0.00008	0.00180
10	0.00068	0.00035	0.00015	0.00062	0.00077	0.00026	0.00007	0.00079
15	0.00084	0.00041	0.00017	0.00078	0.00094	0.00034	0.00010	0.00094
20	0.00134	0.00062	0.00024	0.00126	0.00142	0.00054	0.00017	0.00138
25	0.00165	0.00079	0.00032	0.00156	0.00179	0.00070	0.00021	0.00176
30	0.00193	0.00098	0.00042	0.00180	0.00217	0.00083	0.00025	0.00217
35	0.00249	0.00130	0.00058	0.00232	0.00273	0.00109	0.00035	0.00275
40	0.00348	0.00186	0.00085	0.00330	0.00356	0.00162	0.00061	0.00359
45	0.00508	0.00277	0.00130	0.00490	0.00484	0.00247	0.00106	0.00487
50	0.00771	0.00426	0.00203	0.00762	0.00703	0.00410	0.00209	0.00698
55	0.01179	0.00663	0.00323	0.01190	0.01053	0.00665	0.00374	0.01040
60	0.01823	0.01040	0.00516	0.01874	0.01617	0.01106	0.00688	0.01586
65	0.02837	0.01697	0.00893	0.02922	0.02532	0.01825	0.01213	0.02488
70	0.04357	0.02772	0.01575	0.04466	0.03978	0.03978	0.03978	0.03978
75	0.06492	0.04328	0.02606	0.06655	0.06104	0.06104	0.06104	0.06104
80	0.09544	0.06914	0.04621	0.09748	0.09352	0.09352	0.09352	0.09352
85	0.14012	0.10656	0.07567	0.14347	0.13893	0.13893	0.13893	0.13893
90	0.20181	0.16031	0.12022	0.20733	0.19882	0.19882	0.19882	0.19882
95	0.27851	0.23089	0.18264	0.28663	0.27093	0.27093	0.27093	0.27093
100	0.36219	0.31327	0.26131	0.37229	0.34866	0.34866	0.34866	0.34866

Source: UN Population Division, "Model Life Tables": MLT _UN2011_130_1y.

The applied mortality tables point to an improving general life expectancy of the Zambia population over the projection period. Some exceptions to this rule are noted with respect infant mortality for females which is expected to increase marginally. A similar exception is noted with respect to males age 60 and above where mortality rates are expected to increase by 3 per cent over the projection period. This mortality table has been applied to the NHIS population to simulate the expected attrition.

1.2. Macroeconomic framework

To complement the Zambia demographic profile there is need to also consider the macroeconomic framework, and its interphase with the NHIS.

1.2.1. Labour market

From the current and projected population, it is necessary to determine how many people at each specific age are available for employment, and how many are indeed effectively employed. Consistent with ILO norms, ZamStats defines the labour force participation rate as the *ratio of the country's working-age population that*

engages actively in the labour market, either by working or looking and available for work, relative to the population of the working-age (15 to 65 years).[8]

This perspective is key in considering the number of potential contributors to the NHIS, as well as its effective coverage with respect to the national population. Table 1.3 outlines the structure of the Zambia labour force and its evolution in the preceding period 2017 to 2021.

▶ Table 1.3. Overview of the Zambia labour force, 2017–21

	2017	2018	2019	2020	2021
National population	16 405 229	16 887 720	17 381 166	17 885 422	18 400 556
Working-age population	9 056 840	9 483 400	9 706 101	9 905 071	10 049 191
Labour force	**3 398 294**	**3 329 147**	**3 423 486**	**3 465 526**	**3 615 507**
Unemployed	427 125	381 334	428 383	477 147	450 759
Labour force participation rate	37.5%	35.1%	35.3%	35.0%	36.0%
Employment in formal sector	1 357 186	917 011	901 321	1 000 594	936 941
Employment in informal sector[1]	1 613 984	2 030 802	2 093 782	1 987 785	2 227 808
Total	**2 971 170**	**2 947 813**	**2 995 103**	**2 988 379**	**3 164 749**
Male – formal sector	893 843	664 925	627 787	674 435	653 348
Female – formal sector	463 343	252 086	273 534	326 159	283 593
Total	**1 357 186**	**917 011**	**901 321**	**1 000 594**	**936 941**
Male – informal sector[1]	904 114	1 160 640	1 183 455	1 124 386	1 262 364
Female – informal sector[1]	709 870	870 162	910 327	863 399	965 444
Total	**1 613 984**	**2 030 802**	**2 093 782**	**1 987 785**	**2 227 808**

Note: [1] Inclusive of domestic/household workers.

Sources: ZamStats and author calculations.

Whilst the Zambian labour force has grown marginally over the review period 2017 to 2021, there has been a marked volatility in the number of persons employed in the formal sector, comprised of workers in the public and private sector. The high indebtedness of the Zambian economy has made this sector extremely vulnerable to recurring global economic shocks, inclusive of the 2018 China–United States trade tensions, the COVID-19 pandemic, and the 2021 global energy crisis. The multiple socio-economic distresses caused by COVID-19 resulted in Zambia defaulting on some of its international debt obligations, causing a reduction in the country's finance ratings and an exacerbation of inflationary pressures. Despite some interspersed recovery, the formal sector has yet to regain the 2017 labour participation levels.

The volatility of employment in the formal sector has important ramifications for the NHIS, as the bulk of its contribution income is sourced from this group, who are mandated by law to participate.

The repeat of a COVID-19-like scenario, where there are simultaneous economic and health-related shocks, poses a significant threat to the NHIS as it will likely experience a reduction in contributory capacity by the formal sector, coupled with an increased demand for health services.

[8] ZamStats, *2021 Labour Force Survey Report*, 2022. https://www.zamstats.gov.zm/wp-content/uploads/2023/05/2021-Labour-Force-Survey-NHPP.pdf.

Conversely, the employment patterns of the informal economy have exhibited less volatility. From this review, economic crises appear to trigger a transition of formal sector workers to the informal sector, as opposed to unemployment. The formal sector presents a pro-cyclical pattern since it reduces with crises, whilst the informal sector has a counter-cyclical behaviour since it increases in times of crises, and furthermore serves as a cushion for those who do not find opportunities in the formal sector.

To ensure consistency of contribution income in times of economic crisis, the NHIS should strengthen effective contributory participation of workers in the informal sector.

From a gender perspective, the Zambian labour force is predominantly male, constituting nearly 60 per cent of the workforce. This is despite women and girls accounting for 51 per cent of the national population. Chapter 3 will consider in more detail the NHIS membership, and its assumed evolution over the projection period in the context of the national labour force.

1.2.2. Gross domestic product

The gross domestic product (GDP) growth assumption has important interactions with the demographic and financing inputs of the actuarial analysis exercise. It is theoretically linked to long-term labour productivity trends, including employment and general earnings levels. Positive GDP growth rates can also be expected to improve government revenues. In this circumstance government transfers can possibly be made available as an additional funding option for the NHIS.

To consider the GDP growth rate estimates, reference was made to the historical trends as recorded by Bank of Zambia,[9] as well as the IMF *World Economic Outlook* (WEO) projections.[10] This review indicated that there is good congruence between the historical and projected outlook. A review of the historical Zambian GDP growth rate trends indicate volatility as a consequence of economic and pandemic-related shocks, as referenced above. The lowest growth rates were noted in 2020, when the economy contracted by 2.8 per cent. The Bank of Zambia and the IMF WEO are expecting an economic recovery which is expected to peak at 5 per cent GDP growth in 2027, and remain constant thereafter, as indicated in table 1.4.

▶ Table 1.4. Realized and projected GDP growth rates, 2017–32

	2017[1]	2018[1]	2019[1]	2020[1]	2021[1]	2022[1]	2023[2]	2024[2]	2025[2]	2026[2]	2027[2]	2028[2]	2029[2]	2030[2]	2031[2]	2032[2]
GDP growth rate (%)	3.7	4.0	1.4	-2.8	3.6	2.9	4.0	4.2	4.6	4.8	5.0	5.0	5.0	5.0	5.0	5.0

Notes: [1] Historical GDP figures. [2] Projected GDP figures.

Sources: Bank of Zambia; IMF WEO.

Against this background, the NHIS is expected to operate in a stable macroeconomic environment over the projected period. Against this stable macroeconomic outlook, the IMF WEO GDP growth rate assumptions were adopted for the purpose of actuarial modelling. There is, however, need for caution in adopting this assumption of a stable macroeconomic outlook, given the possibility of recurring health, economic and geo-

[9] Bank of Zambia, *Financial and Other Statistics 2021*. https://www.boz.zm/BoZ_FINANCIALANDOTHERSTATISTICSBOOKLET_2021.pdf.

[10] IMF, *World Economic Outlook*. Database: "Zambia GDP Projections".

https://www.imf.org/en/Publications/WEO/weo-database/2023/April/weo-report?c=754,&s=NGDP_RPCH,&sy=2021&ey=2028&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1,

political shocks. A base GDP value of 426.7 billion Kwacha[11] was adopted as the 2022 input assumption, with due reference to the same sources.

1.2.3. Inflation

Inflation is another key macroeconomic variable to consider in the actuarial analysis exercise. It has an impact on key NHIS variables, such as healthcare costs, real earnings of NHIS members, and return on investment of accumulated technical reserves, among others. Inflation has been a major factor in the Zambian macroeconomic framework, over many decades, resulting in the eventual rebasing of the Zambia Kwacha on 1 January 2013.[12]

▶ Table 1.5. Realized and projected inflation rates, 2017–32

	2017 [1]	2018 [1]	2019 [1]	2020 [1]	2021 [1]	2022 [1]	2023 [2]	2024 [2]	2025 [2]	2026 [2]	2027 [2]	2028 [2]	2029 [2]	2030 [2]	2031 [2]	2032 [2]
Inflation rate (%)	6.1	7.9	11.7	19.2	16.4	9.9	8.3	7.7	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0

Notes: [1] Historical Inflation figures. [2] Projected Inflation figures.

Sources: Bank of Zambia; IMF WEO.

Following the 2013 currency rebase, the Zambian inflation experience has remained largely in single figures, with periodic double-digit spikes (table 1.5). In the period under review (2017–21), there was a significant rise in inflation which peaked in 2020 at 19.2 per cent, and has since receded. The 2022 Bank of Zambia Monetary Policy Committee Statement[13] has signalled an expected continued deceleration of inflation, which is supported by the IMF WEO.[14] The Bank of Zambia monetary policy seeks to maintain inflation within the target range of 6–8 per cent over the medium term.[15] There is need for caution when adopting this view, given the possibility of recurring health, economic and geo-political shocks which can also exacerbate inflationary pressures.

[11] IMF, *World Economic Outlook.* Database. "Zambia GDP Current Price 2021". (October 2022). https://www.imf.org/en/Publications/WEO/weo-database/2022/October/weo-report?c=754,&s=NGDP,&sy=2020&ey=2027&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1.

[12] Bank of Zambia, "Rebase Notice", Circular 17/2012. https://www.boz.zm/17-2012.pdf.

[13] Bank of Zambia, "Monetary Policy Committee Statement", 2022. https://www.boz.zm/MPC_Statement_November_2022.pdf.

[14] IMF, *World Economic Outlook*. Database. "Zambia Inflation Projections". https://www.imf.org/en/Publications/WEO/weo-database/2022/October/weo-report?c=754,&s=PCPIPCH,&sy=2020&ey=2027&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1.

[15] Bank of Zambia, "Monetary Policy Objective", BoZ website. https://www.boz.zm/objectives-of-monetary-policy.htm.

2. Review of the NHIS financial experience

This chapter reviews the financial experience of the NHIS from October 2019 (when the scheme started operations) through to September 2022, the actuarial analysis date. The NHIS financial reports (both audited and management) were considered. These financial reports were applied to provide an economic profile of the NHIS, as well as to confirm the consistency between reported outcomes and the data collected with respect to contribution income and the healthcare benefits payments.

The relatively short operational period of the NHIS is a challenge to consider in this analysis exercise, since it limits the depth of the historical data against which future trends can be inferred.

Given this challenge, it is recommended for NHIMA to improve its monitoring systems, inclusive of a dashboard of key indicators to inform the day-to-day management of the scheme, as well as to increase its internal actuarial capacities and activate plans to undertake regular valuations. In the first years of the scheme, NHIMA can undertake a biannual or annual actuarial valuation exercise.

This recommendation is in line with paragraph 2.3.4(c) of the International Standards on Actuarial Practice (ISAP 2) which recommends that the actuarial analyses should be performed again as new information becomes available.[16] The ILO/HEALTH actuarial model offers a unique advantage in this respect, as it allows for regular actuarial analysis against new and updated data.

2.1. Financial statements

2.1.1. NHIS financial statements

Table 2.1 presents a summary of the NHIS income statement for the years 2019 to 2022.

Table 2.1. Income statement of the NHIS, 2019–22 (in Kwacha '000s)

	2019	2020	2021	2022[1]
Revenues				
Contribution income	100 247	677 313	814 060	735 319
Investment income	188	33 291	177 471	153 294
Other revenues	0	2 335	4 138	7 154
Government grants	2 879	7 407	0	0
Total revenues	**103 314**	**720 345**	**995 668**	**895 766**
Expenditures				
NHIS benefit expenses	0	34 680	174 389	419 605
NHIS general and administrative expenses	4 743	41 066	67 301	67 846
Third-party administrator fees		144 833	158 000	118 500
Total expenditures	**4 743**	**220 579**	**399 689**	**605 951**
Net surplus / (deficit)	**98 571**	**499 767**	**595 979**	**289 815**
End of year reserve	**98 571**	**598 338**	**1 194 317**	**1 484 132**

[1] Based on the NHIS management accounts for a nine-month period ending 30 September 2022.

Source: NHIMA.

[16] International Actuarial Association, International Standard of Actuarial Practice 2. https://www.actuaries.org/IAA/Documents/CTTEES_ASC/Final_ISAPs_Posted/ISAP2_ConformanceChanges_1Dec2018.pdf.

Table 2.1 shows that since inception, the NHIS has had more revenues than expenses. As a consequence, a technical reserve was accumulated over this period, attaining a value of 1.5 billion Kwacha as at baseline date. It can be noted that the contribution income has risen significantly over the observed period, indicative of the scheme's growing membership and improving contributory compliance by the formal sector.

The increase in contribution revenue is naturally counter-balanced by increases in the benefit payments. Table 2.2 reflects the ratio of *contribution income to benefit expenditure* to elucidate the evolving financial equilibrium of the scheme.

▶ Table 2.2. Ratio of NHIS expenditure to income, 2019–22

	2019	2020	2021	2022[1]
Ratio of benefit expenditure to contribution income (%)	0.0	5.1	21.4	57.1
Ratio of total expenditure to total income (%)	4.7	32.6	49.1	82.4

Note: [1] Based on the NHIS management accounts for a nine-month period ending 30 September 2022.

Sources: NHIMA and author calculations.

It is clear from this analysis that the NHIS benefit payments are increasing at a faster rate than contribution income with each passing year, starting from 0 per cent in 2019 to reach 57.1 per cent in 2022. This trend is even more explicit when considering the ratio of total expenditure to total income. From this analysis the NHIS expenditure accounts for 82.4 per cent of contribution income as at September 2022.

NHIS benefit payments are increasing at a faster rate than contribution income.

Whilst it is understood that a newly established scheme will incur high administrative costs in its formative years, it is vital for the scheme to ensure that its financial resources are directed primarily towards securing health services for its members. A major NHIS cost driver has been the third-party administration (TPA) costs payable to the Zambia State Insurance Company Life Limited (ZSIC) for the design and delivery of an information and communication technologies (ICT) administration infrastructure for NHIMA. The total cost of this five-year contract is 0.8 billion Kwacha,[17] with a cumulative amount of 0.4 billion Kwacha paid over the review period. For comparative purposes, a cumulative amount of 0.6 billion Kwacha was paid to meet NHIS benefit expenditure over the same period.

It is usually recommended that administrative costs do not exceed 10 per cent in mature schemes. NHIMA management should ensure that these ICT costs yield the requisite outcomes to aid the operational efficiency and ease of performance management review to support NHIS sustainability considerations. Considering the time taken to get a data extraction for the purpose of this exercise, it is recommended to carefully review TPA agreements and ensure they bring value for money to the end beneficiaries.

Table 2.3 presents the evolution of the NHIS reserve over the period 2019 to 2022.

▶ Table 2.3. Evolution of the NHIS reserve, 2019–22 (in Kwacha '000s)

	2019	2020	2021	2022[1]
Reserve at the beginning of year	**0**	**98 571**	**598 338**	**1 194 317**
Net surplus	98 571	499 767	595 979	289 815
Reallocation to NHIS expenses	-	-	-	-
Reserve at the end of year	**98 571**	**598 338**	**1 194 317**	**1 484 132**
Yearly change (in percentage)	-	507%	100%	24%

Note: [1]Based on the NHIS management accounts for a nine-month period ending 30 September 2022.

Sources: NHIMA and author calculations.

[17] Socieux +, "Operational Review of the National Health Insurance Scheme in Zambia", Technical Report, 2022.

As shown in table 2.3, the NHIS technical reserves have grown substantially over the review period, albeit with a decreasing growth rate in the latter years. This is in line with the experience shown in tables 2.1 and 2.2, indicating an increasing NHIS expenditure burden.

Using the financial information provided in the previous tables, it is possible to express the cost of the benefits paid by the NHIS as a percentage of insurable earnings. This ratio allows the determination of the cost of carry on an annual basis, which is commonly referred to as the pay-as-you-go (PAYG) rate of the scheme. To progress this analysis, the NHIS insurable earnings estimates were based on a flat contribution rate of 2 per cent, with the result adjusted to 80 per cent of the derived total to consider the contribution mix between the formal and informal sector/self-employed workers.

Table 2.4 presents the historic PAYG estimates for the NHIS.

▶ Table 2.4. Evolution of the NHIS PAYG rate, 2019–22

	2019	2020	2021	2022[1]
Insurable earnings	**4 009 872**	**27 092 500**	**32 562 404**	**29 412 756**
NHIS benefit expenses (as % of ins. earnings)	0.00	0.13	0.54	1.43
Total NHIS expenditure (as % of ins. earnings)	0.12	0.81	1.23	2.01

[1] Based on the NHIS management accounts for a nine-month period ending 30 September 2022.

Sources: NHIMA financial statements and author calculations.

The PAYG analysis is instructive as it gives an indication of the target NHIS contribution rate. From this analysis the target NHIS contribution rate for 2022 is 1.43 per cent when considered against health benefit expenses, and 2.01 per cent of earnings when taking into account the total NHIS expenditure.

A clear funding policy of the NHIS should be defined in advance, indicative of a pre-set administrative procedure to effect requisite changes to the contribution rate, as well as the management of technical reserves.

It is important to remember that best international practice dictates that NHIS should be financed at a rate marginally higher than the PAYG rate, with a view to constitute a small reserve to make up for periodic adverse experiences.[18] The reserves were referenced against the NHIS expenses, as shown in table 2.5, which shows the reserve ratio of the NHIS over the 2019–22 period.

▶ Table 2.5. Observed NHIS reserve ratio, 2019–22 (in Kwacha '000s)

	2019	2020	2021	2022[1]
Reserve at the end of year	98 571	598 338	1 194 317	1 484 132
Total NHIS expenditure	4 743	220 579	399 689	605 951
NHIS reserve ratio	**20.78**	**2.71**	**2.99**	**2.45**

Note: [1] Based on the NHIS management accounts for a nine-month period ending 30 September 2022.

Sources: NHIMA financial statements and author calculations.

The NHIS reserve ratio compares the accumulated technical reserves to expenditure. This ratio is a proxy indicator of the adequacy of accumulated reserves to cover the NHIS against adverse experiences. A reserve funding ratio of one (1) means that the accumulated reserves can cover NHIS expenses for one year in case no new revenues are received. As at baseline date (September 2022) the NHIS had a reserve ratio of 2.45, enough to meet expenses for approximately two and half years. This reserve ratio is however expected to

[18] Cichon et al., *Modelling in Health Care Finance.*

change significantly in the coming years against the rapidly changing income and expenditure profile of the NHIS.

The constitution of significant reserves is not, and should not be, an objective in itself.

Table 2.6 shows the rate of return on the NHIS reserves over the observed period. The investment of NHIS reserves has largely been directed towards Government Bonds, Fixed Term Deposits and Treasury Bills.

▶ Table 2.6. Rate of return on NHIS reserve, 2019–22

	2019	2020	2021	2022[1]
Reserve at the end of year ('000 Kwacha)	98 571	598 338	1 194 317	1 484 132
Investment income ('000 Kwacha)	188	33 291	177 471	153 294
Nominal rate of return on reserve (%)	n/a	10.03	21.98	12.14
Annual inflation (%)	11.7	19.2	16.4	9.9
Real rate of return on reserve (%)	**n/a**	**-9.17**	**5.58**	**2.24**

Note: [1] Based on the NHIS management accounts for a nine-month period ending 30 September 2022.

Sources: NHIMA financial statements and author calculations.

The NHIS has realized a return on investments that has outpaced inflation, with the exception of 2020 when inflation peaked at 19.2 per cent. It is key for NHIMA to formalize its investment strategy and related governance structure, with a view to also safeguard accumulated assets against inflation. The NHIS reserve investment strategy could also consider directing investments to augment the infrastructure and equipment capacity of the Zambian health system in a bid to secure long-term value for its members.

3. Data and assumptions for the projection of NHIS contribution income

The purpose of an actuarial projection is to estimate the future financial projections of the scheme. These projections allow stakeholders to identify prospective issues and address them, as required. To progress these financial projections an actuarial model that integrates the calibrated data and assumptions is applied. Significant effort must be made by the actuary to check the consistency of the data used against the historic financial statements, as well as to develop relevant future assumptions.

This chapter will first focus on the assessment of the quality and sufficiency of the NHIS data received for the purpose of progressing the income projections of the actuarial valuation. Subsequently, the discussion will transition to illustrate the process of calibrating the ILO/HEALTH actuarial model using the NHIS data obtained. The financial projections of the scheme will also be informed by the macroeconomic and demographic assumptions developed in Chapter 1. Finally, this chapter will assess the adequacy of these income projections, as well as compare these outcomes with the trends observed in the financial statements of previous years.

3.1. Data quality

The availability of sufficient and reliable NHIS and national data is a key driver of the assumptions made about the future trends of the scheme, and further determines the validity of conclusions of the actuarial analysis exercise. The application of an actuarial valuation requires extensive inputs with respect to scheme-specific data on membership and contribution income, as well as health benefit and administrative expenditure. The scheme-specific inputs are complemented by national demographic and economic data which provide the context in which the scheme operates. Appendix 2 of this report outlines the comprehensive data requested, to progress this actuarial exercise.

This actuarial analysis benefited from significant investments by NHIMA to gather and consolidate the requisite administrative data, financial reports and governance reviews required to meet these prescribed requirements. The data collection and analysis are the most technically demanding steps of an actuarial exercise, which was undertaken over a six-month period from April 2022 to September 2022. A further four-week data reconciliation exercise was undertaken by the multi-disciplinary NHIMA project team to address persistent data deficits. The exercise revealed important gaps in the current monitoring of the scheme as well as a further issue of ownership of the data, the majority of which is warehoused by NHIMA.

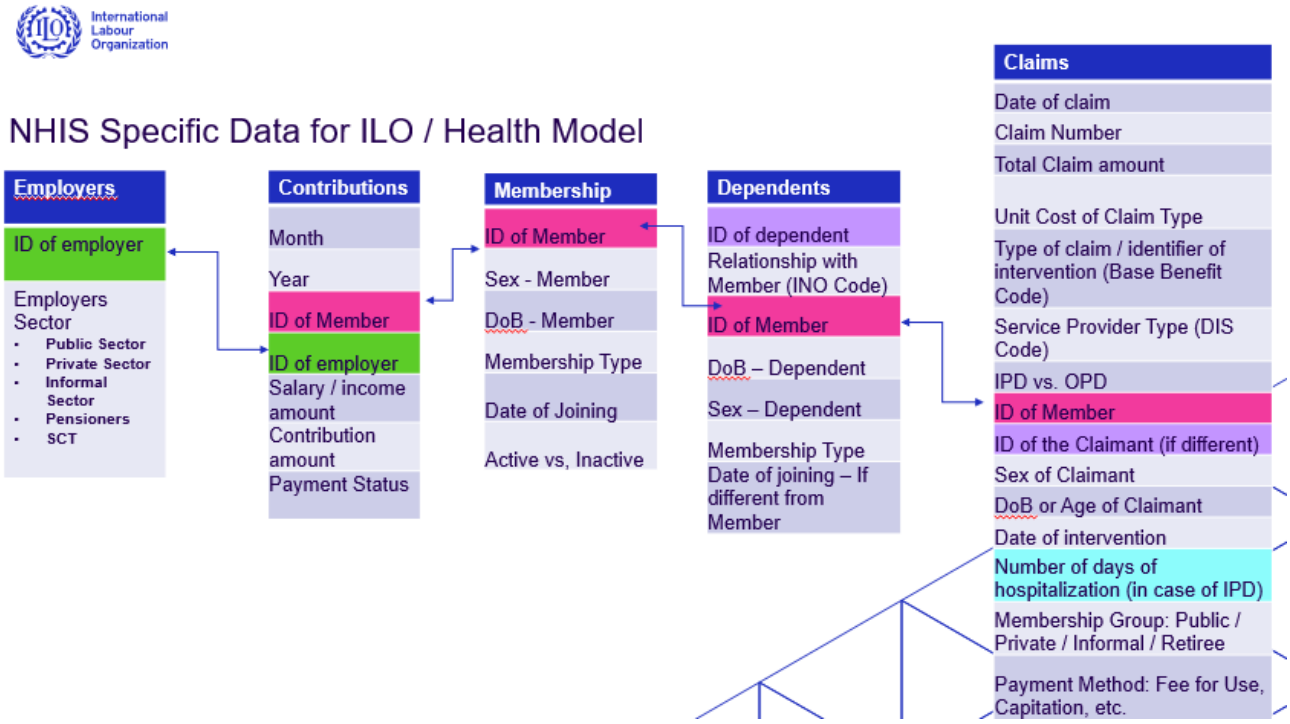
The persistent NHIS data deficiencies noted included the following:

- the lack of a standard member identifier (ID) across the membership, contribution and claim records to ensure a coherent overview;
- incomplete employer identification and member particulars (such as date of birth (DoB), sex, earnings, active vs. inactive membership status) to facilitate the characterization and analysis of NHIS contribution income;
- incomplete beneficiary identification (such as date of birth (DoB), sex, relationship to primary member, unique NHIS identifier) to facilitate the characterization and analysis of NHIS claims data;
- limited pool of registered NHIS dependants to provide a full profiling of the population entitled to health services;
- inconsistencies in the characterization of claim records (such as inpatient versus outpatient services, claimant sex and age); and

- limited national health data statistics to inform NHIS health services utilization assumptions.

Following the NHIMA data cleaning and reconciliation exercises, the NHIS-specific claims and contributions data were successfully differentiated and characterized by age, sex, and membership type of the primary members and their dependants. This considered the specific and general attributes of the NHIS related to the earnings, contribution profile and health benefit expenditure. Figure 3.1 presents the NHIS data sets as requested, and their linkages.

Figure 3.1. Overview of NHIS data map



Source: ILO.

A key obstacle encountered is the limited historical records of the NHIS, as it is a newly established scheme. Historical data are used to evaluate the consistency of observed trends and develop appropriate assumptions about the future. In this circumstance, best-fit assumptions were made from the available NHIS data.

3.2. Application of the ILO/HEALTH Model

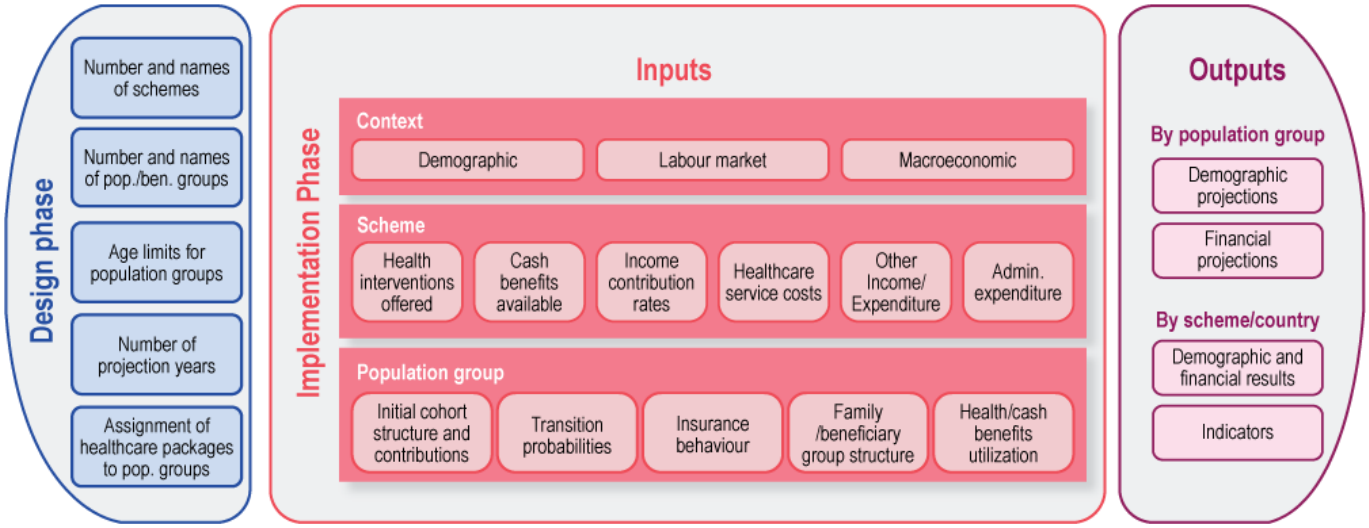
The actuarial analysis of the NHIS has been progressed through the application of the ILO Actuarial Health Model (ILO/HEALTH), an online, computer-based projection and simulation tool developed by the Social Protection Department (SOCPRO) of the ILO. The model's main aim is to support the costing and design of reforms in social protection systems.

The application of the actuarial analysis exercise has been progressed through a collaborative exercise with NHIMA, to strengthen the review of input assumptions and ensure a common understanding and ownership of results, as well as to build the internal actuarial capacity of the NHIS.

3.3. ILO/HEALTH Model design phase

Figure 3.2 outlines the thematic steps undertaken to progress an actuarial valuation, namely the design phase, inputs and outputs. The design phase is the initial calibration of the ILO/HEALTH Model to consider the NHIS unique general characteristics, and the agreed projection parameters.

Figure 3.2. Overview of the building blocks of the ILO/HEALTH Model



Source: ILO, *User Manual ILO/HEALTH Actuarial Model.*

The design phase starts with the calibration of the NHIS product offering, and a profile of scheme participants.

3.3.1. Number and names of scheme

The NHIS is a single scheme providing a standard health service offering referred to as the *NHIMA Benefit Package.*[19] This health benefit package is available to all participating membership groups. The Benefit Package is defined by law in the National Health Insurance (General) Regulations, Fourth Schedule of Statutory Instrument No 63 of 2019.[20] It includes the following health services:

1. Outpatient Department (OPD) consultations, as well as investigations and diagnostic tests (pathology, radiology, X-ray and so on).
2. Pharmaceutical (medicine, drugs) and blood product (transfusions).
3. Surgical services (major and minor).
4. Maternal, new-born and paediatric services.
5. Inpatient Department (IPD) care services (ordinary, private and Intensive Care Unit (ICU) hospitalization, as well as the provision of requisite inpatient healthcare, medicines and investigations).
6. Physiotherapy and rehabilitation services on an inpatient and outpatient basis.
7. Vision care services and provision of corrective spectacles.
8. Dental, oral, and ear, nose and throat (ENT) health services on an inpatient and outpatient basis.
9. Cancer and oncology investigations (such as magnetic resonance imaging (MRI) and computerized tomography (CT) scans) and interventions.
10. Mental health services on an inpatient and outpatient basis.

[19] "NHIMA Benefit Package", Brochure. https://www.nhima.co.zm/download/document/0cc33260ff202106024ae44f75.pdf.

[20] NHIS SI 63, 2019. https://www.nhima.co.zm/publications/si.

11. Medical/orthopaedic appliances and prostheses including crutches, artificial limbs, hearing aids, surgical pins, surgical plates and surgical screws.

3.3.2. Number and names of population/beneficiary groups

Each NHIS population group, as defined by the NHIS, must have unique differentiating characteristics for it to qualify as such. As indicated earlier, the NHIS defines four membership groups, with the following defining characteristics:

1. Public sector – comprised of *central and local government as well as parastatal and state-owned agency employees* as primary members who participate on a *compulsory basis*. Each primary member is entitled to enrol a maximum of six dependants comprising a spouse, and children (including non-biological) 18 years and younger. Contribution by this group is a cumulative 2 per cent contribution rate of *net earnings*, shared equally between the employer and employee.
2. Private sector – comprised of *non-public-sector formal sector employees* as primary members who participate on a *compulsory basis*. Each primary member is entitled to enrol a maximum of six dependants comprising a spouse, and children (including non-biological) 18 years and younger. Contribution by this group is a cumulative 2 per cent contribution rate of *net earnings*, shared equally between the employer and employee.
3. Self-employed – comprised of both *wage and own-account workers* in the informal sector as well as *undeclared workers* in the formal sector as primary members who in practice participate on a *voluntary basis*. Each primary member is entitled to enrol a maximum of six dependants comprising a spouse, and children (including non-biological) 18 years and younger. Contribution by this group is a 1 per cent contribution rate of *self-declared income*, met by the worker only. NHIMA applies an in-house income assessment tool to verify the self-declared income for the self-employed, by considering the household expenditure, geographical location and subsector of the worker, and levying a 1 per cent rate thereon.
4. Pensioners/older persons – comprised of formal-sector pensioners and persons aged above 65. Each primary member is entitled to enrol a maximum of six dependants comprising a spouse, and children (including non-biological) 18 years and younger. This group participates on a non-contributory basis.

3.3.3. Age limits for population groups

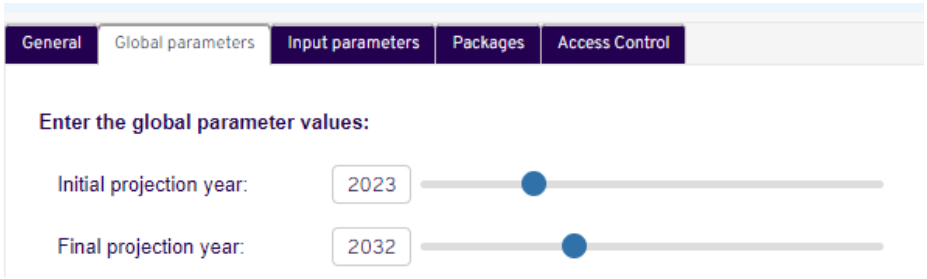
The defined minimum and maximum ages for contributing primary members from the public, private and informal sectors are 18 to 64 years, after which they transition to non-contributory membership under the pensioners/older persons group.

There is no age limit restriction for the dependent spouse of the primary members, whilst the dependent children cannot exceed the age of 18 years.

3.3.4. Number of projection years

The projection period for this actuarial analysis is 10 years covering the period 2023 to 2032. This period is considered suitable for a short-term scheme such as the NHIS. Figure 3.3 is an excerpt from the ILO/HEALTH Model reflecting calibration of the projection period.

Figure 3.3. Excerpt from the ILO/HEALTH Model: Projection years



Source: NHIMA ILO/HEALTH Actuarial Model.

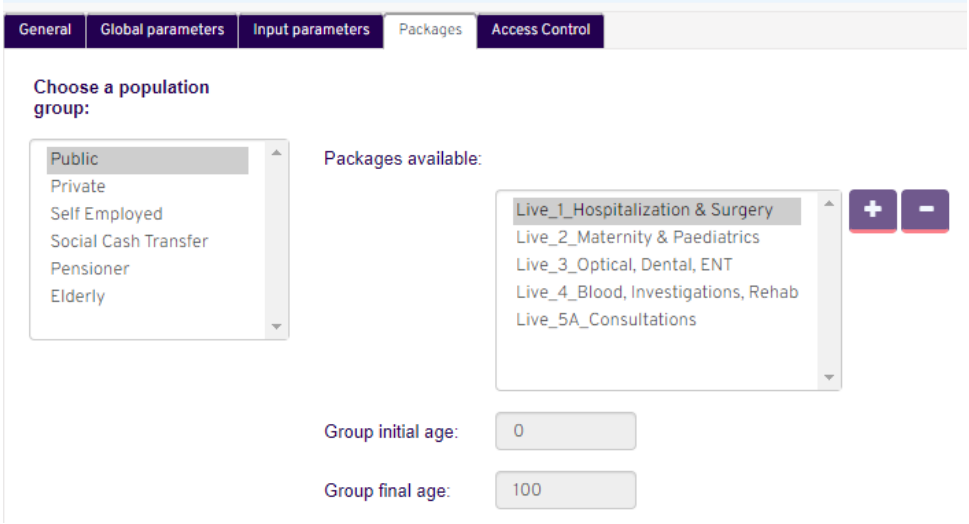
3.3.5. Assignment of healthcare packages to population groups

As previously stated, all the NHIS member groups are entitled to the standard NHIMA Benefit Package. For modelling purposes this package has been categorized into five thematic groups as outlined below:

- Group 1: Hospitalization & Surgery
- Group 2: Maternity & Paediatrics
- Group 3: Optical, Dental & ENT
- Group 4: Blood, Investigations & Rehabilitation
- Group 5: Consultations

There are no age limit restrictions to access the NHIMA package. However, some health services are by their nature gender- and/or age-specific (such as maternity and paediatrics). Figure 3.4 presents an excerpt from the ILO/HEALTH Model depicting the calibration of NHIS membership groups, and their entitlement to specified health services.

Figure 3.4. Excerpt from the ILO/HEALTH Model: Package assignment to population groups



Source: NHIMA ILO/HEALTH Actuarial Model.

3.4. Model inputs for NHIS contribution income

The *input phase* of the ILO/HEALTH Model considers the development of NHIS-specific assumptions that drive the projection outcomes.

3.4.1. Context

To introduce the general demographic and economic context, as outlined in Chapter 1, the ILO/HEALTH Model allows for the inclusion of data related to:

- ✓ National population
- ✓ Labour force participation rates
- ✓ Unemployment rates
- ✓ GDP growth rates
- ✓ Government expenditure as a percentage of GDP
- ✓ Initial GDP monetary value (2022 baseline)
- ✓ National inflation rate

Figure 3.5 presents an excerpt from the ILO/HEALTH Model depicting the calibration of the NHIS demographic context.

Figure 3.5. Excerpt from the ILO/HEALTH Model: Demographic context

[NATPOP] National Population (s,t)

No Sum(col) | No Sum(row) | Check Out | Exp. CSV | To XLSX

Sex: Male

A1:B2 | fx 9929560

	A	B	C
1	Projection time		115,950,653.00
2			Value
3	9,929,560.00	2023	9,929,560.00
4	10,267,165.00	2024	10,267,165.00
5	10,616,249.00	2025	10,616,249.00
6	10,977,201.00	2026	10,977,201.00
7	11,350,426.00	2027	11,350,426.00
8	11,736,340.00	2028	11,736,340.00
9	12,135,376.00	2029	12,135,376.00
10	12,547,979.00	2030	12,547,979.00
11	12,974,610.00	2031	12,974,610.00
12	13,415,747.00	2032	13,415,747.00

Source: NHIMA ILO/HEALTH Actuarial Model.

3.4.2. Initial cohort of NHIS active membership

An analysis of the NHIS data was undertaken to consider the evolution of active membership from scheme inception to 30 September 2022. Table 3.1 presents a summary of the registered NHIS members.

▶ Table 3.1. Evolution of NHIS primary members, by group and sex, 2020–22

	2020			2021			2022[1]		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Public sector	165 103	137 885	302 988	187 507	149 560	337 067	207 459	171 700	379 159
Private sector	227 767	65 839	293 606	365 994	101 990	467 984	429 905	124 361	554 266
Informal sector (Self-employed)	85 068	31 489	116 557	195 148	112 311	307 459	386 650	398 785	785 435
Pensioners / Older persons	564	237	801	122 759	27 155	149 914	125 430	27 655	153 085
Total	**478 502**	**235 450**	**713 952**	**871 408**	**391 016**	**1 262 424**	**1 149 444**	**722 501**	**1 871 945**

Source: NHIMA management, January 2023.

From this review, the cumulative NHIS membership has had an average annual growth rate of 60 per cent. Employees from the formal (public and private) sectors had the largest initial population on account of their mandatory participation status. The number of registered self-employed workers has since grown, resulting in this group now constituting the largest membership group with 785,435 members. From a gender perspective, females comprise 39 per cent of total membership, largely driven by the voluntary registration of self-employed workers.

The actuarial analysis interrogated this NHIS membership database to remove duplicates as well as those members who had exited or were no longer contributing to the scheme.

To be considered as an active contributing member, one must have made a single contribution to the NHIS in the preceding 12-month period.

The exercise further reviewed the profiles of each member by age and sex, as well as to confirm that they were subscribed to the correct membership group. Following this interrogation of the membership data, the *confirmed* NHIS membership was revised downward to 1.45 million (a reduction of 23 per cent). Table 3.2 reflects the validated NHIS membership, which served as the baseline input assumption to the ILO/HEALTH Model.

▶ **Table 3.2. Validated NHIS membership by group and sex, at September 2022**

	Male	Female	Total
Public sector	218 781	189 113	407 894
Private sector	360 910	102 349	463 259
Informal sector / Self-employed	151 035	69 017	220 052
Pensioners / Older persons	241 745	115 080	356 825
Grand total	**972 471**	**475 559**	**1 448 030**

Sources: NHIMA and author calculations.

The largest variance between the registered NHIS members and those confirmed as active was with respect to the self-employed workers.

The NHIS records indicated a total of 785,435 registered self-employed workers as at 30 September 2022, against a confirmed active membership status of 220,052, translating to a 72 per cent reduction. This reduction is indicative of the trend by the self-employed workers to register and pay NHIS contributions only when in need of medical services, and subsequently discontinue contribution payments once the required medical services have been accessed. As a consequence, the NHIS is exposed to adverse selection risks by this group.

There is need to reconsider the NHIMA membership policy with respect to the self-employed in a bid to counter the adverse selection risks, as well as to promote contribution income consistency.

Another notable variance between registered and validated membership records was with respect to the pensioners/older persons group, which grew by 133 per cent following this exercise. This increase was precipitated by the reclassification of members who despite having attained age 65, and therefore eligible for non-contributory participation, were still categorized as workers. Females comprised 33 per cent in the validated membership records.

3.4.3. Modelling of NHIS active contributory population

To consider the prospective evolution of the active membership over the projection period, reference was made to the Zambia labour force profile as presented in Chapter 1, and possible future variations thereto.

The first iteration was to compare the validated NHIS formal sector active membership with the Zambia formal sector labour force as at 2022. Table 3.3 presents the comparative data.

▶ **Table 3.3. NHIS formal sector membership compared to the Zambia formal labour force, by sex, at September 2022**

2022	Male	Female	Total
Public sector NHIS members	218 781	189 113	407 894
Private sector NHIS members	360 910	102 349	463 259
Total NHIS formal sector active members	**579 691**	**291 462**	**871 153**
Formal sector employed labour force	**675 252**	**293 208**	**968 460**
Total employed labour force	**1 980 536**	**1 292 443**	**3 272 979**

Sources: ZamStats, Labour Force Survey (LFS), 2022, and author calculations.

From this comparative analysis, the NHIS active membership constitutes 90 per cent of the formal sector employed labour force. The NHIS membership growth prospects of this sector are therefore limited. The assumptions adopted for the projected growth of NHIS membership rates in the formal sector are for the ratio of males to remain constant, whilst the ratio of female formal sector participation is projected to experience marginal growth (table 3.4). These adjustments are expected to increase NHIS active membership from 90 per cent to 94 per cent of the formal sector employed labour force.

▶ Table 3.4. Projection of NHIS formal sector participation rates compared to the Zambia employed labour force, by sex (percentages)

	Public sector		Private sector	
	Male	Female	Male	Female
2022[1]	6.7	5.8	11.0	3.1
2023	6.7	6.1	11.0	3.2
2024	6.7	6.2	11.0	3.3
2025	6.7	6.3	11.0	3.3
2026	6.7	6.3	11.0	3.3
2027	6.7	6.3	11.0	3.3
2028	6.7	6.3	11.0	3.3
2029	6.7	6.3	11.0	3.3
2030	6.7	6.3	11.0	3.3
2031	6.7	6.3	11.0	3.3
2032	6.7	6.3	11.0	3.3

Note: [1] Actual participation rates based on NHIS active membership and labour force projections.

Sources: ZamStats, LFS, and author calculations.

Whilst the National Health Insurance Act requires self-employed workers to register with the NHIS, the affiliation of this group is undertaken on a voluntary basis. Table 3.5 presents the validated NHIS self-employed worker membership compared to the Zambia informal sector labour force as at 2022.

▶ Table 3.5. NHIS self-employed (informal sector) membership compared to the Zambia labour force, by sex, at September 2022

2022	Male	Female	Total
NHIS self-employed (informal sector) members	151 035	69 017	220 052
Informal sector labour force	**1 305 284**	**999 235**	**2 304 519**
Total employed labour force	**1 980 536**	**1 292 443**	**3 272 979**

Sources: ZamStats, LFS, and author calculations.

The prospective evolution of the participation rates of the self-employed population in the NHIS is more challenging to predict, considering the historically low voluntary uptake of social security by this group. Despite the National Health Insurance Act requirement for self-employed workers to mandatorily register with the NHIS, in practice affiliation to the scheme is voluntary.

To progress this assumption, reference was made to the NHIMA Strategic Plan (2023–2026),[21] which sets a target of registering 80 per cent of the self-employed workforce to the scheme, against a baseline of 6.7 per cent as at baseline date. Against this commitment by NHIMA to invest additional resources to realize this outcome, and the gains realized to date, the modelled NHIS participation for this group is presented in table 3.6.

Table 3.6. Projection of NHIS self-employed (informal sector) participation rates as a percentage of the Zambia labour force, by sex, 2022–32 (percentages)

	Male	Female
2022[1]	4.6	2.1
2023	6.2	3.2
2024	8.7	4.7
2025	11.0	6.2
2026	13.0	7.6
2027	14.7	9.0
2028	16.3	10.4
2029	17.7	11.8
2030	18.9	13.1
2031	19.9	14.4
2032	20.8	15.7

Note: [1] Actual participation rates based on the NHIS active membership and labour force projections.

Sources: ZamStats, LFS, and author calculations.

The adopted input assumption for the evolution of the NHIS participation rates with respect to self-employed workers is more conservative than the NHIMA Strategic Plan targets. The adopted participation rates translate to NHIMA realizing 52 per cent coverage of the self-employed labour force at the end of the projection period (2032), against the NHIMA strategic target of 80 per cent.

Table 3.7 shows the cumulative evolution of NHIS contributory membership comprised of formal (public and private) sector employees and self-employed workers, as simulated by the ILO/HEALTH Model.

Table 3.7. Projected evolution of cumulative NHIS contributory membership, by sex, 2023–32

	Male	Female	Total NHIS active membership
2023	998 996	352 178	1 351 174
2024	1 171 935	429 768	1 601 703
2025	1 352 280	513 175	1 865 455
2026	1 534 663	598 952	2 133 616
2027	1 717 599	693 823	2 411 422
2028	1 863 741	772 160	2 635 901
2029	2 006 474	855 131	2 861 605
2030	2 145 034	938 827	3 083 861
2031	2 278 575	1 027 336	3 305 910
2032	2 412 449	1 120 889	3 533 338

Source: NHIMA ILO/HEALTH Model – [PTT_MDAT] Table Main Demographic Aggregates.

[21] https://www.nhima.co.zm/download/document/6e0fa33fe6202303026b0a19cc.pdf.

3.4.4. Modelling of NHIS dependent population

A data deficiency which was not overcome was with respect to the NHIS dependant registry.

Participation in the NHIS is extended to a maximum of six (6) dependants for each primary member, typically consisting of a spouse (age unlimited) and up to five children (5) under age eighteen (18), including non-biological dependants. A review of the NHIS registry indicates a record of only 633,210 dependants (compared to the 1.45 million confirmed active primary members of the NHIS as at 30 September 2022). Table 3.8 presents the profile of registered NHIS dependants by age and sex.

▶ **Table 3.8. Profile of registered NHIS dependants, by age and sex**

Age	Male	Female	Total
0-4	64 567	61 317	125 884
5-9	82 039	80 828	162 867
10-14	67 195	80 248	147 443
15-19	36 683	40 541	77 224
20-24	52	4 649	4 701
25-29	489	15 638	16 127
30-34	1 857	18 461	20 318
35-39	3 931	14 913	18 844
40-44	4 369	11 232	15 601
45-49	3 732	7 598	11 330
`+50	7 366	25 505	32 871
Total	272 280	360 930	633 210

Source: NHIMA.

Despite not being registered, the dependants of NHIS active primary members remain entitled to health services as and when requested. An age and sex profile of these unregistered dependants is needed to project the future demand and utilization of NHIS health services. The available NHIS registry of dependants includes less than 10 per cent of the dependent population. As such, the profile of registered NHIS dependants was considered too small to serve as proxy for the unregistered population.

In order to bridge this important data gap, a proxy profile of NHIS dependants was developed based on the age and sex profile of the national population derived from the National Census Reports for 2010 and 2022, as well as the Zambia Demographic and Health Survey 2018[22] to consider aspects such as household size, total fertility rates, and marriage statistics. Table 3.9 presents the marriage statistics as applied to the ILO/HEALTH Model to develop the spouse profile for the primary NHIS members.

[22] https://www.zamstats.gov.zm/publications/#.

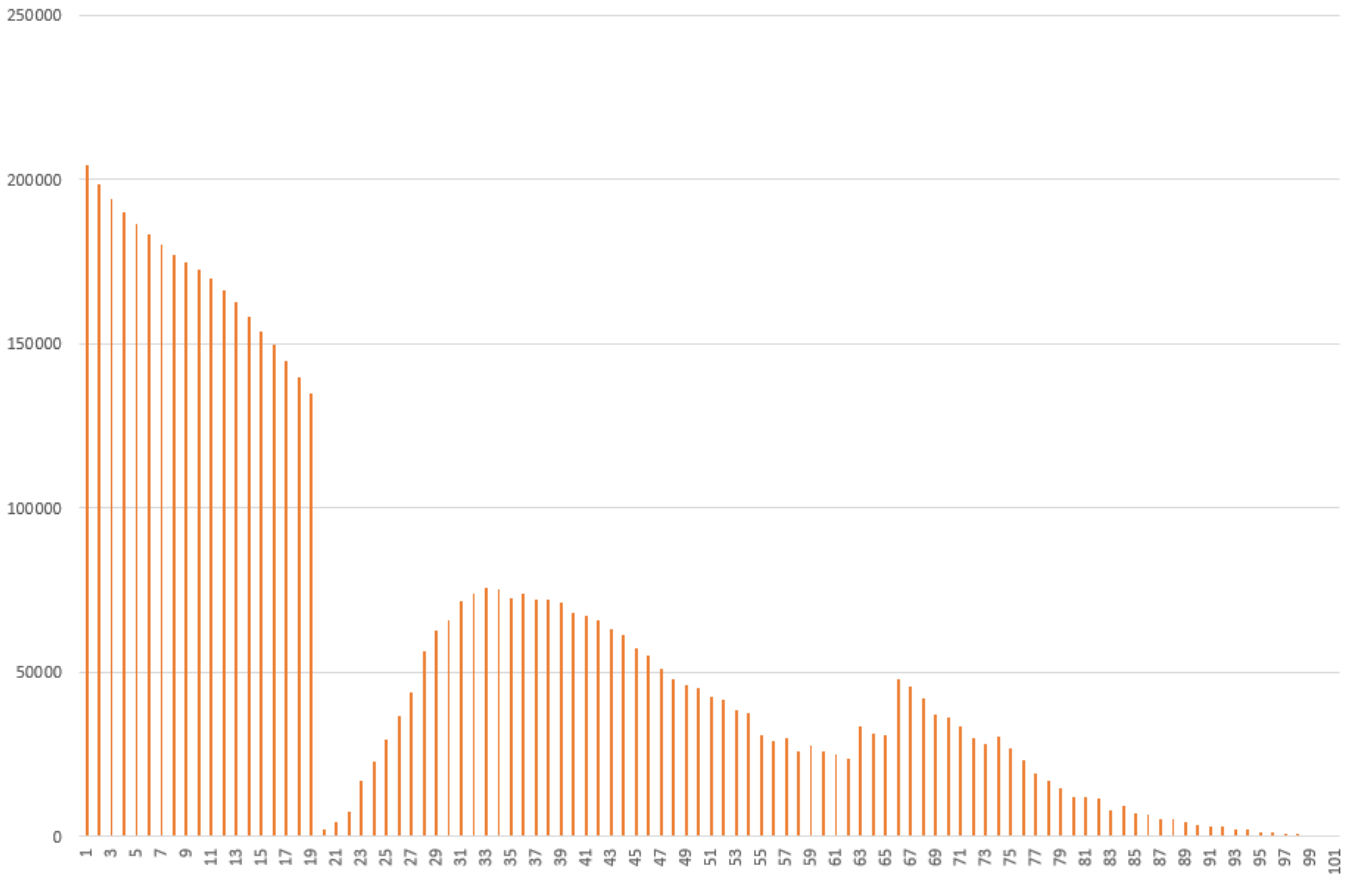
Table 3.9. Zambia marriage statistics as applied to the ILO/HEALTH Model, by age and sex (percentages)

Age	Male	Female
15-19	1.1	14.4
20-24	22.3	52.3
25-29	62.9	68.3
30-34	81.9	74.5
35-39	85.9	76.1
40-44	88.1	71.7
45-49	88.3	68.1
`+50	88.9	68.7

Source: Zambia Demographic and Health Survey 2018.

Against these input statistics, the ILO/HEALTH Model facilitated the development of a proxy profile of the NHIS dependent population. Figure 3.6 presents the modelled age profile of the total NHIS population totalling 5,878,560 as at September 2022.

Figure 3.6. Modelled age profile of NHIS population at September 2022



An analysis of the modelled population indicates a low rate of NHIS coverage for the population aged above 19–24.

This coverage gap is occasioned by the termination of NHIS dependency affiliation at age 18, and the minimal representation of this age group in the employed labour force. To address this deficit the NHIMA Strategic Plan envisages the extension of coverage to tertiary students.[23] This consideration has not however been factored into this analysis exercise, which seeks to assess the financial sustainability of the scheme in its current format. The evolution of the total NHIS population over the projection period was also considered and is presented in table 3.10.

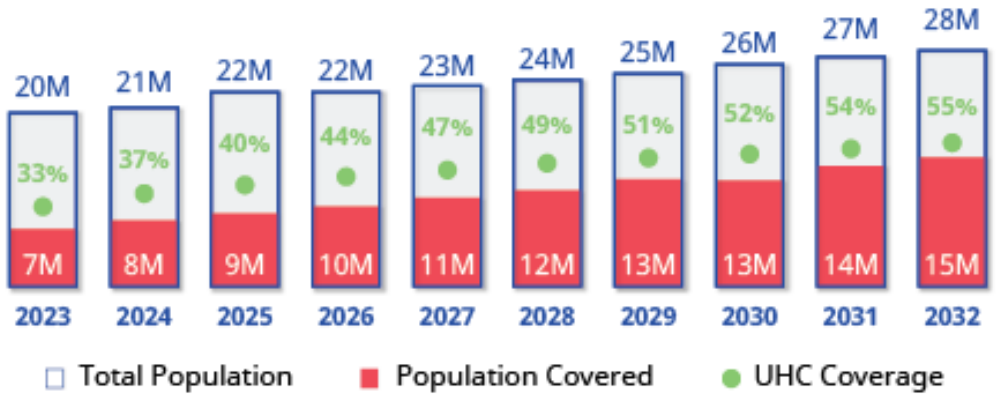
▶ Table 3.10. Evolution of NHIS population, by group and sex, 2023–32

	Dependants		Pensioners			Active			
	Male	Female	Male	Female	Total Dependants for NHIS active membership	Male	Female	Total NHIS active membership	Total NHIS coverage
2023	1 864 162	2 369 505	609 159	601 118	5 443 944	998 996	352 178	1 351 174	**6 795 118**
2024	2 165 432	2 751 614	614 734	608 720	6 140 501	1 171 935	429 768	1 601 703	**7 742 204**
2025	2 487 683	3 157 317	620 108	616 182	6 881 290	1 352 280	513 175	1 865 455	**8 746 745**
2026	2 819 630	3 573 434	625 329	623 402	7 641 793	1 534 663	598 952	2 133 616	**9 775 409**
2027	3 170 803	4 003 494	630 339	630 441	8 435 077	1 717 599	693 823	2 411 422	**10 846 500**
2028	3 450 296	4 347 041	635 011	637 169	9 069 516	1 863 741	772 160	2 635 901	**11 705 417**
2029	3 736 137	4 690 043	639 279	643 447	9 708 906	2 006 474	855 131	2 861 605	**12 570 510**
2030	4 020 379	5 027 039	642 791	649 011	10 339 220	2 145 034	938 827	3 083 861	**13 423 081**
2031	4 309 788	5 361 601	646 134	654 214	10 971 736	2 278 575	1 027 336	3 305 910	**14 277 646**
2032	4 609 042	5 702 082	649 257	659 486	11 619 867	2 412 449	1 120 889	3 533 338	**15 153 205**

Source: NHIMA ILO/HEALTH Model – [PTT_MDAT] Table Main Demographic Aggregates.

Against these projections, total NHIS coverage is anticipated to grow from 6.7 million in 2023 to 15.2 million in 2032, representing a growth in coverage of the national population from 33 to 55 per cent, as shown in figure 3.7.

▶ Figure 3.7. Projection of NHIS coverage compared to the national population, 2023–32



Source: NHIMA ILO/HEALTH Model – [PTT_MDAT] Table Main Demographic Aggregates Data.

[23] NHIMA, "Strategic Plan 2023–2026". https://www.nhima.co.zm/download/document/6e0fa33fe6202303026b0a19cc.pdf.

3.4.5. Modelling of NHIS contributory capacity

To consider the prospective evolution of NHIS contribution income, an analysis of the actual earnings of the active membership of each contributory group by age and sex was developed. This data was smoothed to remove outliers and generate an age- and sex-specific theoretical earnings profile for each membership group against which the legislated contribution rates will be levied. Table 3.11 presents the NHIS contribution schedule.

Table 3.11. Structure of NHIS contribution schedule

	Employer	Member	Total
Public sector	1% of basic earnings	1% of basic earnings	2% of basic earnings
Private sector	1% of basic earnings	1% of basic earnings	2% of basic earnings
Informal sector/Self-employed	n/a	1% of declared income	1% of declared income
Pensioners/Older persons +65 yrs	n/a	n/a	n/a

Sources: NHI Act and SI 63.

The analysis of the NHIS wage profile indicated that employees from the private sector had the highest average monthly earnings at 7,343 Kwacha per month, followed by employees from the public sector and self-employed workers with 5,984 Kwacha and 4,532 Kwacha respectively. The observed NHIS average earnings for the formal (public and private) sector are in line with the national trends of 6,441 Kwacha per month, as depicted by the national Labour Force Survey 2021.[24]

The NHIS earnings average of 4,532 Kwacha per month for self-employed workers is significantly higher than the national informal sector average of 2,191 Kwacha, as per the Labour Force Survey 2021.

This experience is indicative of the wide diversity of earnings that exists amongst the self-employed.

Further analysis of the informal sector is recommended to consider the earnings and contributory capacity of the wider self-employed workforce, as well as their understanding of the NHIS offering, and registration barriers.

From a gender perspective, males had marginally higher average earnings with respect to the public sector employees and self-employed workers, whilst the average earnings for females was higher with respect to employees from the private sector. A review of the 2020 Labour Force Survey indicates that 18.3 per cent of females occupy “Manager” or higher “Professional” appointments, compared to 13.6 per cent of males.

Table 3.12 depicts a sample of the derived earnings profile of the NHIS contributor groups.

[24] ZamStats, *2021 Zambia Labour Force Survey*, 2022. https://www.zamstats.gov.zm/publications/

▶ Table 3.12. Monthly earnings profile of NHIS contributor groups, by age and sex (excerpt)

	Public		Private		Self-employed	
Age cohort	Male	Female	Male	Female	Male	Female
21	2 051	3 885	1 405	1 401	1 746	2 998
22	2 271	3 441	1 370	1 542	1 749	3 209
23	2 540	3 475	1 444	1 633	1 839	3 174
24	3 005	3 789	1 866	1 910	1 842	3 429
25	3 514	4 175	2 003	2 098	1 942	3 228
26	4 076	4 635	2 178	2 404	2 013	3 170
27	4 509	4 943	2 112	2 727	2 278	3 277
28	4 901	5 255	2 407	3 206	2 481	3 477
29	5 172	5 450	2 780	3 667	2 654	3 754
30	5 329	5 550	3 077	3 987	2 744	3 536
31	5 405	5 565	3 362	4 353	2 952	3 323
32	5 384	5 567	3 666	4 825	3 092	3 226
33	5 425	5 565	3 938	5 380	3 311	3 475
34	5 556	5 594	4 421	5 894	3 430	3 820
35	5 680	5 583	4 848	6 342	3 469	3 971
36	5 783	5 565	5 314	6 676	3 469	3 910
37	5 787	5 569	5 526	6 875	3 685	4 000
38	5 930	5 637	5 810	7 227	3 911	4 228
39	6 068	5 701	6 219	7 510	4 130	4 710
40	6 227	5 762	6 633	8 022	4 058	4 617
41	6 216	5 752	6 863	8 137	4 245	4 696
42	6 256	5 821	7 246	8 826	4 359	4 893
43	6 275	5 802	7 295	8 622	4 460	5 020
44	6 446	5 892	7 860	9 326	4 495	5 086
45	6 566	5 945	7 998	9 336	4 613	4 993
46	6 673	6 047	8 453	10 004	4 650	5 120
47	6 753	6 121	8 292	10 043	4 588	4 889
48	6 876	6 277	8 491	10 570	4 610	4 891

Source: NHIMA ILO/HEALTH Model – [ITsal] Theoretical Salary Curve.

Another aspect considered was the consistency of contributions made by each group. This was inferred from the variance of NHIS registered members as at 2022 and confirmed active contributors over the same period. Self-employed workers had a 72 per cent variance between registered and contributing members, whilst a 7 per cent reduction was noted with respect to formal-sector employees. Against this experience, the adopted assumption for the density of annual contributions was 10 out of 12 months for the formal (public and private) sector, and 4 out of 12 months for the self-employed. This input assumption was held constant over the projection period. Table 3.13 reflects the density of contribution assumptions adopted.

Table 3.13. Expected number of contribution months per annum for NHIS contributor groups

Number of contributions months per annum	
Public sector	10
Private sector	10
Informal sector/Self-employed	4

Source: NHIMA ILO/HEALTH Model – [Contmonths] Months of contribution per year.

The earnings growth assumptions for the NHIS contributor groups were derived from the actual NHIS experience observed over the 2019 to 2022 period, complemented by the national earnings profile. Table 3.14 shows the evolution of national earnings growth and inflation experience from 2014 to 2022.

Table 3.14. Zambia earnings growth and inflation experience, 2014–22 (in Kwacha and percentages)

	2014	2015	2016	2017	2018	2019	2020	2021	2022[1]
National average earnings	2 344	2 673	3 001	3 330	3 215	4 010	4 393	4 215	4 332
Formal sector average earnings	3 009	3 317	3 625	3 933	4 387	5 873	5 793	6 441	6 220
Informal sector / Self-employed average earnings	1 214	1 577	1 940	2 303	1 368	1 597	2 193	2 191	2 143
National average earnings growth rate (%)	n/a	14	12	11	-3	25	10	-4	3
Inflation rate (%)	7.9	21.1	7.5	6.1	7.9	11.7	19.2	16.4	9.9

Note: [1] National average salary estimate (as at September 2022), from ILO ECO-POP model.

Sources: ZamStats, LFS and Bank of Zambia *Statistical Bulletin 2021*.

Against these reflections, the NHIS earnings growth assumptions for the contributor groups were developed with NHIMA, as presented in table 3.15.

Table 3.15. Annual NHIS earnings growth assumptions, 2023–32 (percentages)

	Public sector	Private sector	Informal sector/Self-employed
2023	3.3	3.3	0
2024	3.3	3.3	0
2025	3.4	3.4	0
2026	3.4	3.4	0
2027	3.5	3.5	0
2028	3.5	3.5	0
2029	3.6	3.6	0
2030	3.6	3.6	0
2031	3.7	3.7	0
2032	3.7	3.7	0

Source: NHIMA ILO/HEALTH Model – [asg_in] Assumed Salary Growth.

The adopted earnings growth assumptions for the formal (public and private) sector are below the observed and projected inflation rates, resulting in a gradual reduction of real wages. This observation is however

consistent with the Zambia experience, which sees earnings typically drag below inflation, with periodic sharp corrective adjustments. A nil earnings growth assumption was adopted with respect to self-employed workers against the expected reduction in the average earnings of this group as registration is expanded to a wider cross-section of this cluster. The earnings growth assumptions can be revised in future actuarial exercises against the realized outcomes.

The number of active contributing members is multiplied by the expected earnings, and the assumed number of contribution months per annum, to derive the annual contribution income estimates for each group. This contribution profile is adjusted annually against the earnings growth assumptions and the updated membership (adjusted for new entrants and exits), to progress the contribution income estimates across the projection period. Table 3.16 reflects the expected contribution income from each contributor group.

Table 3.16. Expected NHIS contribution income, by group, 2023–32 (in Kwacha)

	Public sector	Private sector	Informal sector/ Self-employed	Total NHIS contributory income
2023	515 707 089	638 229 224	43 587 074	1 197 523 387
2024	562 056 417	717 021 522	65 091 363	1 344 169 302
2025	612 757 544	781 137 913	92 044 061	1 485 939 518
2026	672 376 301	851 457 779	120 720 780	1 644 554 860
2027	737 304 298	928 998 816	150 632 951	1 816 936 065
2028	799 124 582	1 006 833 974	180 048 596	1 986 007 151
2029	854 990 476	1 078 737 059	208 301 574	2 142 029 109
2030	915 976 467	1 157 360 649	236 213 258	2 309 550 373
2031	981 362 371	1 239 283 071	263 646 640	2 484 292 081
2032	1 052 537 091	1 329 413 181	291 200 024	2 673 150 295

Source: NHIMA ILO/HEALTH Model – [CONTg] Total amount from contributions by population group.

The NHIS contribution income is expected to increase from 1.2 billion Kwacha in 2023 to 2.7 billion Kwacha in 2032.

3.4.6. Modelling of other NHIS income

Other NHIS income streams noted were *investment income* generated from technical reserves, *government grants*, and *accreditation fees* paid by prospective healthcare service providers. With respect to investment income, an initial value of the NHIS reserve was established at 1.5 billion Kwacha, as at baseline date. The annual investment return assumptions were based on the past performance of the NHIS reserves, as well as the GDP growth and inflation outlook. NHIS reserves have largely been invested in Government Bonds, Fixed Term Deposits and Treasury Bills, whose yields are responsive to prevailing inflation levels. From the analysis of past NHIS experience, this investment strategy has assisted the NHIS to realize a return on investments that has outpaced inflation by 4 to 5 per cent. Table 3.17 is indicative of the nominal interest rate assumption applied to NHIS reserves.

Table 3.17. Interest on NHIS reserves, 2023–32 (percentages)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Interest on NHIS reserves	12.0	12.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Source: NHIMA ILO/HEALTH Model – [i_rate] Interest Rate of the Reserve Fund.

It was assumed that no income would be realized from government grants, as these were provided in 2019 and 2020 to assist with NHIMA's establishment costs and have since been terminated. Similarly, the prospective income to be realized from accreditation fees was not considered in the actuarial analysis. NHIMA is not expected to generate significant income from this activity to impact the sustainability assessment of the NHIS.

3.4.7. Reconciliation with financial statements

A critical step in assessing the credibility of income data analysis, and the assumptions formulated, is to compare the calculated contribution income streams with the NHIS financial statements. It is expected that these results are consistent.

Table 3.18. Comparison of calculated and reported NHIS contribution income, 2020–22 (in Kwacha '000s)

Financial year	Calculated contribution income – NHIS data	Reported contribution income –NHIS financial statements	Difference	% of discrepancy
Jan.-Dec .2020	-	677 312	677 312	100
Jan. -Dec. 2021	718 637	814 060	95 423	13
Jan.-Sept .2022	697 011	735 318	38 307	5

Sources: NHIMA financial statements and author calculations.

A review of the variance results above is indicative of the evolution of NHIS data capacity from inception to date. The NHIS membership and contribution data were incomplete for the first year of operation (2020), and as such inadequate to progress contribution income analysis. These data capacities have since improved in subsequent years, yielding a 5 per cent variance in the most recent contribution cycle (January–September 2002). It is against this experience that the contribution income assumptions were considered as credible.

There is need for the NHIS to monitor the variance between actual and expected contributions, to ensure that any residual arrears are effectively collected.

4. Data and assumptions for the projection of NHIS expenditure

NHIS expenditure is largely driven by health benefit costs. These costs are applied against services derived from the *NHIMA Benefit Package*[25] which is defined by the National Health Insurance Act (Act), and the National Health Insurance (General) Regulations, Fourth Schedule of Statutory Instrument No 63 of 2019 (SI 63), as outlined below:

1. Medical Care
    - 1.1. Consultations, examinations
    - 1.2. Diagnostic services (Radiology and laboratory)
    - 1.3. Nursing Care
    - 1.4. Hospitalization
    - 1.5. Intensive Care Unit
2. Surgery:
    - 2.1. General Surgery
    - 2.2. Anaesthetics
    - 2.3. Orthopaedics
    - 2.4. Paediatric Surgery
    - 2.5. Ear, Nose and Throat
3. Maternity and Neonatal Care:
    - 3.1. Antenatal Care
    - 3.2. Delivery (Normal or Assisted)
    - 3.3. Caesarean Section
    - 3.4. Postnatal Care
4. Eye Care Services:
    - 4.1. Selected services
5. Oral Health Services:
    - 5.1 Selected services
6. Pharmaceutical Drugs and Supplies:
    - 6.1. Prescription generic drugs on the essential drugs list prescribed by an accredited health care provider and approved or used under the scheme.
    - 6.2. Medical supplies
    - 6.3. Blood products
7. Physiotherapy:
    - 7.1. Selected services

This Benefit Package is equally accessible by all membership groups, and their dependants.

[25] NHIMA, "NHIMA Benefit Package", Brochure. https://www.nhima.co.zm/download/document/0cc33260ff202106024ae44f75.pdf.

4.1. Administrative overview of the NHIMA Benefit Package

The NHIS has formulated a *schedule of services* available to its membership, and *prescribed fees.* The fees are informed by the nature of the service, as well as the type of health provider. As at baseline date, there was a total of 331 accredited healthcare providers nationwide. Of these, 183 were private, 105 public and 43 faith-based service providers. For the purposes of assigning service costs, the NHIS has categorized faith-based service providers as public entities.

Table 4.1 presents the NHIS classification codes of accredited service providers.

Table 4.1. NHIS service provider classification codes

Code	Category	Type	Tariff Level
301	Public	Hospital	301 - Level One Provider
			301 - Level Two Provider
			301 - Level Three Provider
304	Private	Hospital	304 - Private Hospital Class A Level 1
			304 - Private Hospital Class A Level 2
			304 - Private Hospital Class B & Class C
307	Private	Diagnostic	307 – Private Diagnostic
308	Private	Pharmacy	308 – Private Pharmacy
309	Private	Optical	309 – Private Optical
310	Public	Blood & Transfusion	310 – Public Blood Product & Services

Source: NHIMA claims management system.

This schedule of services also outlines the payment methods to be applied by the NHIS to reimburse health providers in respect of medical services provided to its members. Three unique reimbursement methods are applied by the NHIS, namely *Fee for Service*, *Capitation* and *Diagnosis Related Grouping*. Table 4.2 presents the classification codes applied by NHIMA in its fee schedule and claims management system, against these respective reimbursement methods.

Table 4.2. NHIS claims codes

Code	Reimbursement Method
ZDRG	Diagnosis Related Grouping
ZCAP	Capitation
ZFF	Fee for Service

Source: NHIMA claims management system.

The *Fee for Service* payment method is applied where healthcare providers are paid a standard fee for each unit of service rendered. The amount due to a health service provider will therefore be determined by the number of services rendered, and the unit cost of such services. The NHIS has applied this payment method largely against the provision of prosthetics and appliances as well as medical diagnosis tests.

The NHIS applies the *Capitation* payment method largely with respect to outpatient (OPD) consultative services. This payment method requires the NHIS to make an advance payment to service providers (typically hospitals) based on the number of patients expected to be serviced during the ensuing period. NHIMA applies a post payment against the actual number of patients assisted.

The *Diagnosis Related Grouping* (DRG) payment method is applied by the NHIS with respect to its array of inpatient (IPD) services including surgery and hospitalization as well as mental health services. The cost structure of the medical treatment applied is variable, informed by the severity of the illness as well as the complexity and resource intensity of applied care. Inpatient diagnostics services are an exception, as they are paid using the capitation method.

The NHIMA Benefit Package is delivered through the application of multiple health services grouped into 35 unique health intervention service groups. These groups were classified into five (5) thematic groups for modelling purposes. Despite being thus grouped, the 35 NHIMA health service interventions were modelled individually to enhance the accuracy of projection outcomes. The list of the health service intervention groups (and their NHIS classification codes) is presented below.

▶ List of NHIS health intervention codes, and thematic packages

a. Package 1: Hospitalization & Surgery **(Diagnosis Related Grouping)**

1. 2630 - Inpatient Hospitalization
2. 2631 - Inpatient Dialysis
3. 2634 - Inpatient Oncology
4. 2637 - Mental Health
5. 2638 - Inpatient Minor Surgery
6. 2639 - Inpatient Surgical Procedures
7. 2640 - Inpatient Major Surgery
8. 2642 - Inpatient Orthopaedics
9. 2644 - Inpatient Accommodation

b. Package 2: Maternity & Paediatrics **(Diagnosis Related Grouping)**

10. 2632 - Inpatient Maternity
11. 2633 - Inpatient Paediatrics

c. Package 3: Optical, Dental & ENT **(Diagnosis Related Grouping)**

12. 2635 - Inpatient Optical
13. 2641 - Inpatient Dental Procedures
14. 2670 - Inpatient Ear, Nose, Throat
15. 2720 - Outpatient Optical Pack
16. 2730 - Outpatient Dental

d. Package 4: Blood, Investigations & Rehabilitation **(Fee for Service)**

17. 2643 - Outpatient Exercise Therapy
18. 2648 - Inpatient Blood & Blood Products
19. 2649 - Inpatient Prosthesis & Appliances
20. 2650 - Inpatient Pathology
21. 2651 - Inpatient Radiology
22. 2652 - Inpatient MRI/ICT
23. 2700 - Private Pharmacy Drugs
24. 2711 - Outpatient Pathology
25. 2712 - Outpatient Radiology
26. 2714 - Outpatient Prosthesis & Appliances

27. 2731 - Outpatient MRI/ICT

e. Package 5: Consultations **(Capitation)**

28. 2645 - Outpatient Initial Consultations
29. 2646 - Outpatient Subsequent Consultations
30. 2647 - Outpatient Chronic Consultations
31. 2654 – Drugs
32. 2691 - Inpatient Level One Consultation
33. 2692 - Outpatient Level One Consultation
34. 2750 - Antenatal Services
35. 2751- Antenatal Visits

Table 4.3 presents an excerpt of the NHIS *schedule of fees* for medical services available, with respect to *Inpatient* and *Outpatient Pathology* health services groups (duly coded **2650** and **2711** respectively in the NHIMA claims management system).

This excerpt presents the list of *pathology-related* services available and their associated costs. In this sample, the costs prescribed are applicable to *diagnostic services* rendered by *private health providers* (code **307** in the NHIMA claims management system). The costs in this sample are reimbursed on a *fee for service* basis (code **ZFF** in the NHIMA claims management system).

▶ **Table 4.3. NHIS schedule of fees in respect of pathology health services (excerpt)**

Code Description	Discipline	Code	Payment Mechanism	Tarrif (ZMW)			
				2019	2020	2021	2022
RPR test for syphilis	307	30001	ZFF	0.00	56.68	56.68	56.68
Rapid HIV Test - Determine	307	30003	ZFF	0.00	70.42	70.42	70.42
Rapid HIV Test - SD Bioline	307	30004	ZFF	0.00	102.05	102.05	102.05
Rapid HIV Test - Wantai	307	30005	ZFF	0.00	56.92	56.92	56.92
Rapid duo HIV /syphilis test - SD Bioline	307	30006	ZFF	0.00	151.54	151.54	151.54
Rapid Hepatitis C	307	30007	ZFF	0.00	136.24	136.24	136.24
Rapid Hepatitis B	307	30008	ZFF	0.00	136.24	136.24	136.24
Rheumatoid Factor	307	30009	ZFF	0.00	136.24	136.24	136.24
CD4,CD8 Count	307	30010	ZFF	0.00	196.14	196.14	196.14
HIV Viral load Analysis	307	30011	ZFF	0.00	422.04	422.04	422.04
Magnesium	307	30013	ZFF	0.00	60.44	60.44	60.44
Calcium	307	30014	ZFF	0.00	61.39	61.39	61.39
Phosphorus	307	30015	ZFF	0.00	63.85	63.85	63.85
Cholesterol	307	30016	ZFF	0.00	3,376.27	3,376.27	3,376.27
Auto-Creatinine	307	30017	ZFF	0.00	59.78	59.78	59.78
HDL cholesterol	307	30018	ZFF	0.00	94.69	94.69	94.69
LDL cholesterol	307	30019	ZFF	0.00	118.31	118.31	118.31
Urea	307	30021	ZFF	0.00	76.69	76.69	76.69
Albumin	307	30022	ZFF	0.00	59.86	59.86	59.86
Total protein	307	30023	ZFF	0.00	59.09	59.09	59.09
Acid phosphatase	307	30024	ZFF	0.00	87.80	87.80	87.80
Uric acid	307	30025	ZFF	0.00	66.84	66.84	66.84
Triglycerides	307	30026	ZFF	0.00	61.29	61.29	61.29
Auto-BILIRUBIN D	307	30027	ZFF	0.00	60.48	60.48	60.48
Auto-BILIRUBIN T	307	30028	ZFF	0.00	57.09	57.09	57.09
Lipase	307	30029	ZFF	0.00	81.00	81.00	81.00
LDH liquid	307	30031	ZFF	0.00	78.88	78.88	78.88
CK NAC activated	307	30032	ZFF	0.00	2,048.35	2,048.35	2,048.35
GOT (ASAT	307	30033	ZFF	0.00	58.90	58.90	58.90
GPT (ALAT)	307	30034	ZFF	0.00	59.07	59.07	59.07
G-GT	307	30035	ZFF	0.00	69.28	69.28	69.28

Source: NHIMA claims management system.

4.2. Claims data analysis

As discussed in Chapter 3, the availability of sufficient, reliable and consistent data is a key pillar on which the validity of the actuarial analysis exercise is premised. For the purposes of this actuarial exercise, only the NHIS claims experience from January 2021 to September 2022 was considered. The claims experience for the period prior to January 2021 was not considered, for two reasons. First, claims prior to January 2021 were recorded manually, and the manual records were not sufficiently available to provide a basis for reliable and consistent comparative analysis with the current data as harnessed from the computerized NHIS claims management system. Second, the computerized data also provided the most recent claims experience, which is more applicable to project future trends.

Over the January 2021 to September 2022 period, the scheme has evidenced an ever-increasing claims trend across the vast majority of health service groups.

This is indicative of the fact that the scheme is still in its initial establishment phase, and health expenditure is growing rapidly.

Without sufficient historical experience to determine established NHIS long-term claim trends, accurate modelling of the future evolution of the scheme is challenging. Regular actuarial valuation exercises are therefore recommended to gauge the evolving NHIS claim expenditure profile.

4.2.1. Overview of NHIMA claims data

The evaluation of the NHIS claims profile began with a holistic review of the claims experience across the 35 health service intervention groups. Over the review period (January 2021 to September 2022), the total number of claims authorized for payment was 2.3 million, translating to a total benefit cost of 0.675 billion Zambia Kwacha.

The health intervention group with the highest cost was the *Outpatient Initial Consultations* (claims code **2645**), at a value of 151.0 million Kwacha, translating to 22.4 per cent of approved claims. This outcome is to be expected, as this service (**2645**) is the general consultation/primary level consultation, the entry pathway to other follow-up NHIS health services as may be needed.

The second highest value of approved claims was evidenced with respect to *Private Pharmacy Drugs* (claims code **2700**), with a total amount of 112.3 million Kwacha (16.6 per cent of total approved claims). This claims group (**2700**) had the highest number of claims, with nearly 687,901 claims recorded. This outcome is again reasonable, given the high cost of drugs for any social health protection system where they are covered. Interestingly, the cost of drug claims provided by the public health system (*Drugs* – **2654**) constitutes the lowest NHIS cost centre at 30,876 Kwacha. NHIMA has since advised that the cost of drugs as provided by the public health providers does not have a unique tariff structure: rather, the cost of drugs is co-mingled with other service costs delivered through the DRG payment method. This has resulted in this low expenditure experience. It must be noted, however, that during the actuarial reference period the public health system was characterized by a constrained drug supply chain. Consequently, private pharmacy drug supplies were increasingly used to alleviate the supply shortages from the public health system.

A health intervention group with a surprising claims experience was the *Outpatient Optical Packs* (claims code **2720**) which is third highest in value, with approved claims valued at 112.0 million Kwacha. Paired with *Inpatient Optical Services* (claims code **2635**), with approved claims valued at 39.3 million Kwacha, this results in optical services being the highest cost centre for the NHIS in the period under review. While vision impairment is an important public health concern and a determinant of poverty and exclusion, it would be reasonable to analyse this high claim number in further detail. It is noted that optical-related illnesses are not referenced as a major health concern in Zambia.[26] Caution should be used, as poor vision is often underestimated at national population level.

NHIMA has suggested that the observed trend with respect to optical services was a result of supplier-driven demand, as the same optical services provider could diagnose, prescribe and provide requisite services and products. NHIMA has since implemented administrative reforms related to optical and dental services in a bid to curb this anomalous claim experience.

Table 4.4 presents the NHIS approved claim volumes and costs across all health service intervention groups.

[26] ZamStats, *Zambia Demographic and Health Survey*, 2018. https://www.zamstats.gov.zm/publications/.

▶ Table 4.4. NHIS claim volumes and costs, by health service intervention group, at 30 September 2022

Claim group	Claim group description	Number of claims	Total value of claims (Kwacha)	Average cost per claim (Kwacha)
2645	Outpatient Initial Consultations (OPD)	463 532	151 044 337	325.9
2700	Private Pharmacy Drugs (OPD)	687 901	112 321 068	163.3
2720	Outpatient Optical Packs (OPD)	70 618	112 096 475	1 587.4
2712	Outpatient Radiology (OPD)	132 642	44 723 799	337.2
2635	Inpatient Optical (IPD)	21 487	39 296 008	1 828.8
2711	Outpatient Pathology (OPD)	342 522	37 725 422	110.1
2644	Inpatient Accommodation (IPD)	23 572	24 423 623	1 036.1
2641	Inpatient Dental Procedures (IPD)	11 309	22 295 108	1 971.4
2730	Outpatient Dental (OPD)	32 074	19 916 264	620.9
2646	Outpatient Subsequent Consultations	64 435	16 495 794	256.0
2731	Outpatient MR/ICT (OPD)	5 467	14 734 180	2 695.1
2632	Inpatient Maternity (IPD)	6 549	13 559 329	2 070.4
2631	Inpatient Dialysis (IPD)	3 021	10 112 341	3 347.3
2692	Outpatient Level One Consultation (OPD)	152 700	8 666 042	56.8
2714	Outpatient Prosthesis & Appliances (OPD)	2 466	8 498 361	3 446.2
2630	Inpatient Hospitalization (IPD)	8 829	7 658 003	867.4
2651	Inpatient Radiology (IPD)	19 181	6 858 512	357.6
2648	Inpatient Blood & Blood Products (IPD)	4 839	5 386 105	1 113.1
2643	Outpatient Exercise Therapy (OPD)	38 023	5 147 044	135.4
2640	Inpatient Major Surgery (IPD)	2 207	4 771 087	2 161.8
2639	Inpatient Surgical Procedures (IPD)	1 128	1 671 187	1 481.5
2647	Outpatient Chronic Consultations (OPD)	12 774	1 542 104	120.7
2638	Inpatient Minor Surgery (IPD)	2 005	1 337 460	667.1
2750	Antenatal Services (OPD)	2 782	955 653	343.5
2642	Inpatient Orthopaedics (IPD)	333	931 071	2 796.0
2633	Inpatient Paediatrics (IPD)	1 607	831 512	517.4
2691	Inpatient Level One Consultation (IPD)	5 106	699 752	137.0
2649	Inpatient Prosthesis & Appliances (IPD)	145	529 482	3 651.6
2637	Mental Health (IPD)	149	303 911	2 039.7
2652	Inpatient MRI/CT (IPD)	29	229 400	7 910.3
2670	Inpatient Ear, Nose, Throat (IPD)	179	193 118	1 078.9
2634	Inpatient Oncology (IPD)	222	165 461	745.3
2751	Antenatal Visits (OPD)	634	154 680	244.0
2650	Inpatient Pathology (IPD)	836	88 551	105.9
2654	Drugs (IPD & OPD)	137 313	30 876	0.2

Sources: NHIMA claims management system and author calculations.

A consideration of the volume and total claim costs for each health intervention group allowed the average cost per claim to be determined, a first step to developing the unit cost assumptions for modelling purposes. From this review the health intervention group with highest average cost of underlying services accessed is Code **2652** relating to *Inpatient Medical Resonance Imaging (MRI)/Computerized Tomography (CT)* diagnostics, whilst the lowest claims code is **2654** (*Drugs*), as supplied by the public health system.

The comparison of the average claim cost of drugs of 163.30 Kwacha (as supplied by private pharmacies – claims code **2700** of 163.30 Kwacha), and 0.20 Kwacha (as supplied by the public health system – claims code **2654**) offers an interesting perspective on the different cost structures applicable to these systems (public vs. private health suppliers).

Another perspective considered was an assessment of which membership group accessed the largest share of NHIS services with respect to claim volumes, as well the value of approved claims over the analysis period (table 4.5).

▶ Table 4.5. NHIS claims by membership type, at September 2022

Membership group	Total number of claims	Total value of claims (Kwacha)	Average cost per claim (Kwacha)
Public sector	1 128 076	308 106 461	273.13
Private sector	460 357	146 979 963	319.27
Informal sector/Self-employed	531 216	178 930 616	336.83
Pensioners/Older persons	138 967	41 376 080	297.74
Total	**2 258 616**	**675 393 120**	**299.03**

Sources: NHIMA claims management system and author calculations.

The results of this review show that public sector employees and their dependants accessed the largest quantum of health services numbering 1.1 million claims (50 per cent of total claim volume) at a cost of 0.308 billion Kwacha (46 per cent of total value). It is interesting to note that this group had the lowest average cost at 273.13 Kwacha per claim.

Self-employed workers and their dependants represent the second highest quantum of claims (numbering 0.5 million) costing 0.178 billion Kwacha. The services accessed by this group however had the highest average cost (at 336.83 Kwacha per claim).

An analysis was also undertaken to consider the NHIS claims profile with reference to the type of health services provider (table 4.6).

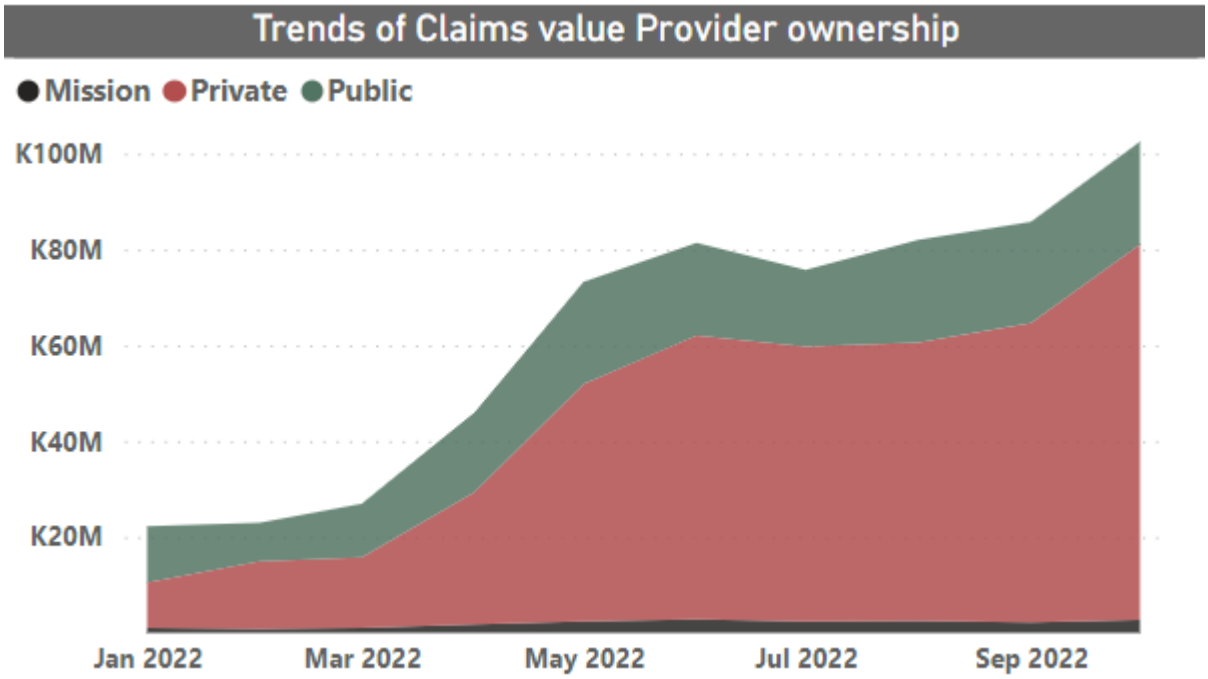
▶ Table 4.6. NHIS claims by type of health service provider, at September 2022

Type of health service provider	Total number of claims	Total value of claims (Kwacha)	Average cost per claim (Kwacha)
Public	780 624	209 965 532	268.97
Private	1 477 992	465 427 588	314.91
Total	2 258 616	675 393 120	299.03

Sources: NHIMA claims management system and author calculations.

The majority of NHIS health services by volume (65 per cent) as well as by value (69 per cent) have been provided by private healthcare providers, where the average claim cost of services provided is 16 per cent higher than that of public providers. It is worth noting that private healthcare providers constitute 55 per cent of the NHIS accredited providers. These accredited providers differ in terms of capacity and the nature of services provided. A numeric comparison only is inadequate to explain the observed preference for private healthcare providers. Figure 4.1 reflects the increasing uptake of the services supplied by private providers over the January 2022 to September 2022 period.

▶ **Figure 4.1. NHIS claims trends, by type of health service provider**



Source: NHIMA Performance Management Dashboard.

4.3. Model inputs for NHIS claims experience

To progress the calibration of the ILO/HEALTH Model to project the NHIS claims experience, there is need to consider age-specific *unit costs* and *utilization rates* against each of the 35 health service group interventions as modelled.

4.3.1. Modelling of NHIS unit costs

To derive the age-specific unit costs against each health service intervention group, an analysis of the volume and cost of services for each membership group was made. In setting the unit cost assumptions for each health service intervention group, the following were considered:

- type of health services constituting the intervention group, and the unit cost thereof;
- type of health services provider (public vs private); and
- profile of users accessing the health services (by age as well as by membership group).

As indicated above, each intervention group offers numerous underlying services, each with its own unique cost (see table 4.3 above, excerpt of NHIS schedule of fees with respect to *Inpatient* and *Outpatient Pathology*). As shown in table 4.7 (health service intervention group **2647** – *Outpatient Chronic Consultation*), the same service can also have a different cost structure depending on the type of provider.

▶ Table 4.7. Health services for outpatient chronic consultations

Health service code	Outpatient Chronic Consultations (consistent OPD linkage)	Tariff 2021/22 (Kwacha)	Supplier code	Supplier description
ZCAP1703	Chronic conditions after initial and two subsequent visits	35.00	301	301-Level 2-3 Provider
ZCAP1703	Chronic conditions after initial and two subsequent visits	300.00	304	304-PVT Hospital (Class A - Level 1 / 2)
ZCAP1708	Ml/co chronic	225.00	304	304-PVT Hospital (Class A - Level 1 / 2)
ZCAP1709	Specialist chronic	400.00	304	304-PVT Hospital (Class A - Level 1 / 2)

Source: NHIMA claims management system.

Further, the unit costs determined should be age-specific. An age-based analysis of the utilization patterns of underlying services per intervention group was developed for each NHIS membership group. Table 4.8 presents the age-specific unit costs calculated with respect to health service intervention group **2647** – *Outpatient Chronic Consultations*, as at baseline date.

▶ Table 4.8. NHIS unit claim cost for outpatient chronic consultations (2647), at September 2022 (in Kwacha)

2647 health services	Public sector	Private sector	Informal/Self-employed	Pensioners/Older persons
0 - 5	57.24	98.29	125.15	137.64
6 - 10	57.24	98.29	125.15	137.64
11 - 15	69.63	119.56	152.24	167.43
16 - 20	69.63	119.56	152.24	167.43
21- 25	69.63	119.56	152.24	167.43
26 - 30	55.31	94.98	120.94	133.01
31 - 35	40.96	70.34	89.56	98.50
36 - 40	58.77	100.92	128.51	141.33
41 - 45	60.67	104.18	132.66	145.89
46 - 50	76.26	130.96	166.75	183.39
51 - 55	79.63	136.74	174.12	191.49
56 - 60	68.60	117.80	150.00	164.97
61 - 65	100.12	171.92	218.91	240.76
66 - 70	97.18	166.89	212.50	233.71
71 - 75	110.76	190.20	242.19	266.36
76 - 80	101.29	173.94	221.48	243.58
81 - 85	80.95	139.00	176.99	194.65
86 - 90	80.95	139.00	176.99	194.65
91 - 95	80.95	139.00	176.99	194.65
96 - 100	80.95	139.00	176.99	194.65

Sources: NHIMA claims management data and author calculations.

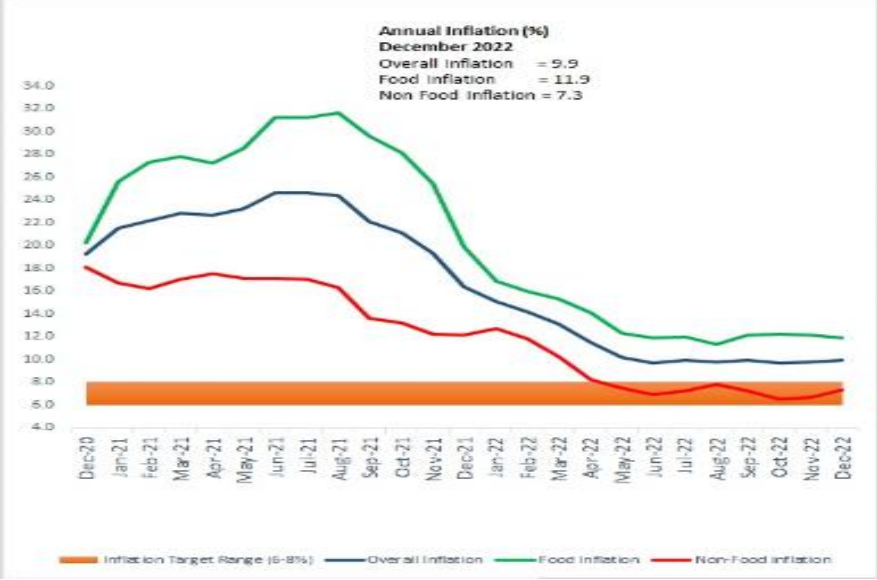
A review of the cost structure applicable to this health service intervention group (**2647** – *Outpatient Chronic Consultations*), indicates that the highest cost experience is incurred with respect to pensioners/older persons and their dependants, whilst the lowest is with respect to public sector employees and their dependants.

Once the baseline age-specific unit costs for the 35 intervention groups are determined, there is need to consider how these unit costs will evolve over the projection period. Several factors were considered to inform the medical inflation assumptions, namely:

- the national inflation estimates;
- changes to the type of health services accessed; and
- changes to the health delivery service patterns by public and private healthcare providers.

As per the discussion in Chapter 1, the Zambia inflation outlook is expected to taper off at 7 per cent, consistent with the national inflation targets (figure 4.2). NHIMA's adjustment of medical inflation costs is however premised on the non-food inflation rates, which in Zambia trends lower than the national and food inflation rates. NHIMA expects to be able to utilize its bulk health services buying power to keep medical cost inflation below the national inflation levels. Against this premise, the NHIS medical inflation was pegged to non-food inflation estimates. This assumption is adopted with caution, as NHIS purchasing power may not be as strong as hoped, given the high number of private healthcare providers whose pricing may be driven by other exogenous factors.

Figure 4.2. Zambia inflation rates, 2020–22



Source: ZamStats.

Another unit cost driver considered is the increasing uptake of services supplied by private healthcare providers. This trend is also expected to have an impact on the evolution of NHIS medical costs, as private healthcare services generally have higher unit costs. This trend is not expected to continue indefinitely, on account of capacity constraints in the private providers. The baseline unit costs of health services, as determined, already factors in the current spread of healthcare provision between public and private providers.

Finally, a change in the access patterns of the health services that constitute each intervention can also change the overall unit cost assumption. The NHIS claims history was however too short to progress assumptions on changing access patterns, so unit costs were held constant in this regard.

Against a cumulative consideration of the above factors, an NHIS-specific health service medical cost inflation trend was developed, as presented in table 4.9.

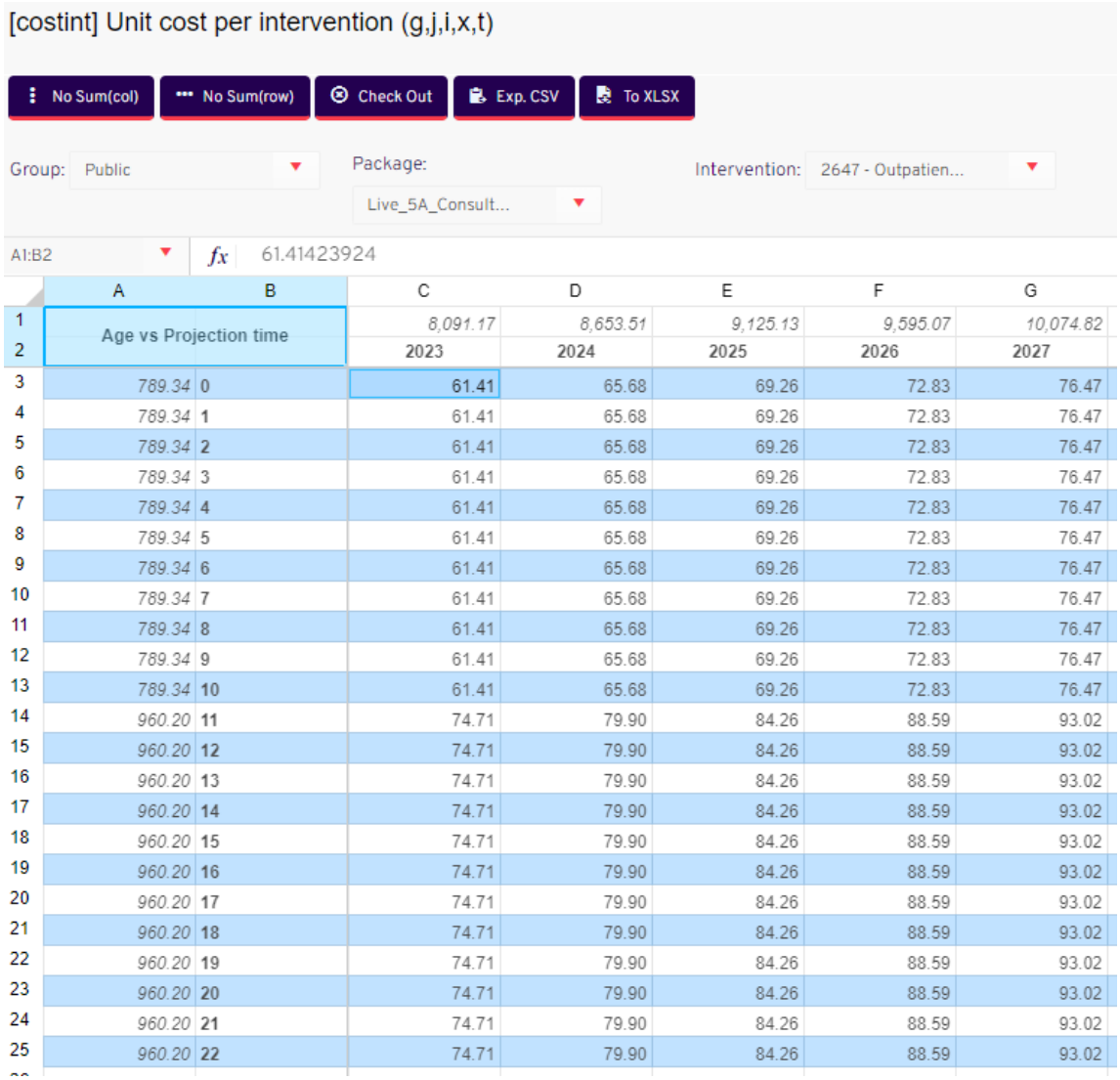
Table 4.9. NHIS medical and Zambia national inflation assumptions, 2023–32 (percentages)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
National inflation estimates	9.6	7.7	7.2	7.0	7.0	7.0	7.0	7.0	7.0	7.0
NHIS medical inflation assumptions	**7.0**	**5.5**	**5.2**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**

Sources: Bank of Zambia, IMF WEO, and author calculations.

The NHIS medical inflation assumptions were subsequently applied to the age-specific unit costs of each health service intervention group to finalize the ILO/HEALTH medical cost inputs. Figure 4.3 is an excerpt from the ILO/HEALTH Model indicative of the finalized unit cost input assumptions specific to health service intervention group **2647** – *Outpatient Chronic Consultations*, as applied to public sector employees and their dependants.

Figure 4.3. Modelled unit cost assumptions for outpatient chronic consultation services, 2023–27 (excerpt, in Kwacha)



	A	B	C	D	E	F	G
1	Age vs Projection time		8,091.17	8,653.51	9,125.13	9,595.07	10,074.82
2			2023	2024	2025	2026	2027
3	789.34	0	61.41	65.68	69.26	72.83	76.47
4	789.34	1	61.41	65.68	69.26	72.83	76.47
5	789.34	2	61.41	65.68	69.26	72.83	76.47
6	789.34	3	61.41	65.68	69.26	72.83	76.47
7	789.34	4	61.41	65.68	69.26	72.83	76.47
8	789.34	5	61.41	65.68	69.26	72.83	76.47
9	789.34	6	61.41	65.68	69.26	72.83	76.47
10	789.34	7	61.41	65.68	69.26	72.83	76.47
11	789.34	8	61.41	65.68	69.26	72.83	76.47
12	789.34	9	61.41	65.68	69.26	72.83	76.47
13	789.34	10	61.41	65.68	69.26	72.83	76.47
14	960.20	11	74.71	79.90	84.26	88.59	93.02
15	960.20	12	74.71	79.90	84.26	88.59	93.02
16	960.20	13	74.71	79.90	84.26	88.59	93.02
17	960.20	14	74.71	79.90	84.26	88.59	93.02
18	960.20	15	74.71	79.90	84.26	88.59	93.02
19	960.20	16	74.71	79.90	84.26	88.59	93.02
20	960.20	17	74.71	79.90	84.26	88.59	93.02
21	960.20	18	74.71	79.90	84.26	88.59	93.02
22	960.20	19	74.71	79.90	84.26	88.59	93.02
23	960.20	20	74.71	79.90	84.26	88.59	93.02
24	960.20	21	74.71	79.90	84.26	88.59	93.02
25	960.20	22	74.71	79.90	84.26	88.59	93.02

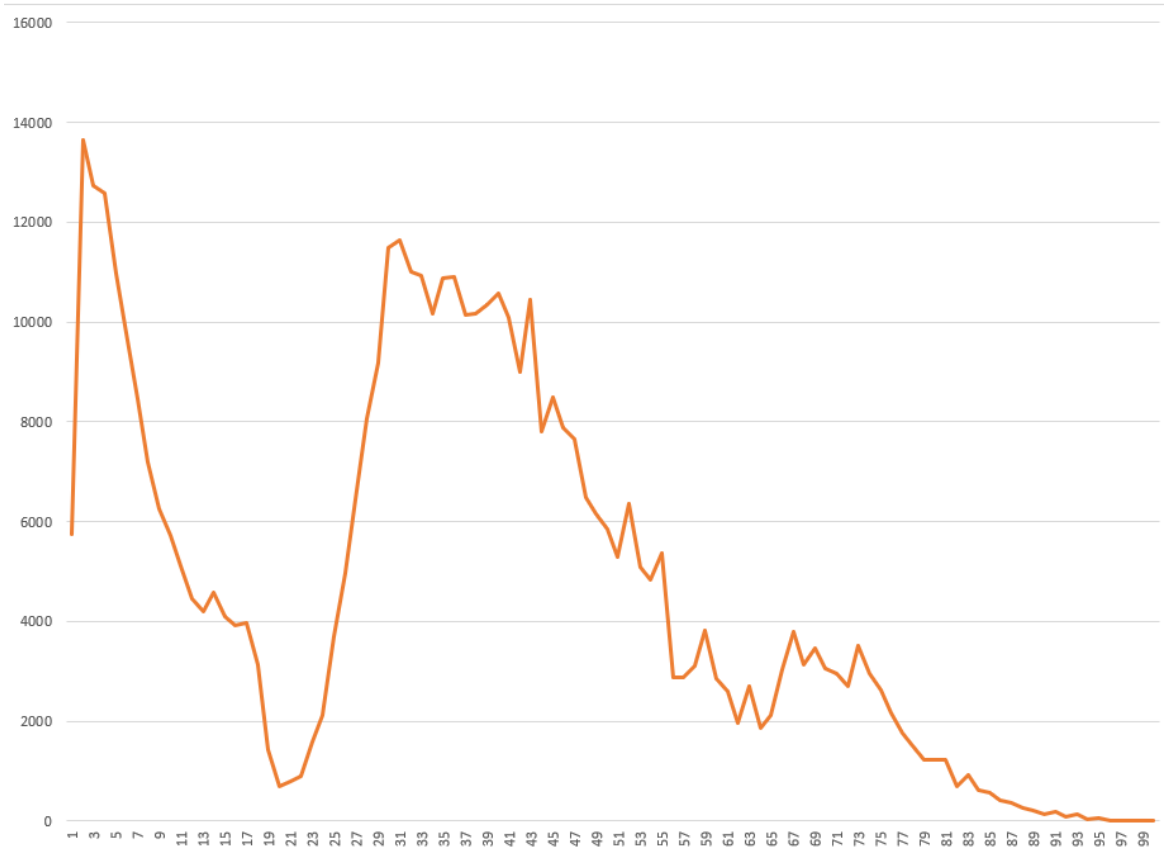
Source: NHIMA ILO/HEALTH Model – [costint] Unit Cost per Intervention.

4.3.2. Modelling of NHIS health service utilization rates

To derive the age-specific utilization rates for each health service intervention group, an analysis of the volume of services consumed by each age group was referenced against the total NHIS membership population at the same age group.

Figure 4.4 presents an age-based claims volume analysis undertaken with respect to health service intervention group **2645** – *Outpatient Initial Consultations*.

Figure 4.4. Claims volume analysis of NHIS outpatient initial consultations (2645), by age, at September 2022



Sources: NHIMA claims management data and author calculations.

These age-based claims volumes were duly referenced against the age-specific NHIS population profile (as presented in Chapter 3) to develop utilization rates for each health service intervention group, and were subsequently uploaded as inputs to the ILO/HEALTH Model.

Due to low data volumes for some of the health service intervention groups, it was not possible to develop age-specific utilization rates unique to each membership group (public sector, private sector, self-employed workers, pensioners/older persons). To overcome this deficit, NHIS consumption data were consolidated to progress utilization rates premised on the total NHIS membership and beneficiary population profile.

Figure 4.5 presents the age-based utilization rates as developed with respect to the NHIS *Inpatient Hospitalization* intervention group – **2630**.

Figure 4.5. Utilization rates of NHIS inpatient hospitalization (2630), by age, at September 2022

Sources: NHIMA claims management data and author calculations.

It is important to highlight that the utilization rates as determined at baseline date are not static, but will evolve over the projection period. This is a vital consideration, as the NHIS is a newly established scheme. NHIMA will have to monitor the evolution of the health expenditure profile closely.

To model the prospective evolution of the utilization rates over the projection period, the growth rates of health service utilization specific to each health service group were considered against the national health provider capacity to produce unique assumptions for each intervention. The specialist knowledge of the NHIMA Health Insurance Services and the Quality Assurance & Accreditation Units concerning national health provider capacity and specific disease burden estimates provided vital inputs to progress these prospective health service utilization growth rates.

Table 4.10 presents a sample of the *actual* (2022) and *assumed* health service utilization growth rates with respect to the health interventions *Inpatient Maternity* – **2632** and *Inpatient Paediatrics* – **2633**.

Table 4.10. Actual and assumed health service utilization growth rates applicable to inpatient maternity (2632) and inpatient paediatrics (2633) interventions, 2022–32 (percentages)

	2632 – Inpatient Maternity	2633 – Inpatient Paediatrics
2022[1]	84	811
2023[2]	84	100
2024[2]	42	50
2025[2]	21	25
2026[2]	11	13
2027[2]	5	6
2028[2]	3	3
2029[2]	1	2
2030[2]	1	1
2031[2]	0	0
2032[2]	0	0

Notes: [1]Actual NHIS claims experience 2021/22. [2]Assumed NHIS claims experience 2023/32.

Sources: NHIMA claims management data and author calculations.

These annualized growth rates were subsequently applied to the baseline utilization rates of each intervention group to reflect the expected changes thereto over the projection period.

4.3.3. Modelling of NHIS benefit expenditure

Finally, the projected intervention-specific health benefit expenditure estimates for each *year (t)* were progressed by multiplying the *covered population (CovPop)*, with the *utilization rates* and *unit costs* applicable to each age-band, as illustrated by the formula below.

$$BE_t = CovPop_t * Utilization\ rate_t * Average\ Unit\ Cost_t$$

The benefit expenses derived against each age-specific band were subsequently summed to give the expected total benefit expenditure for each health service intervention group for each respective year. Table 4.11 presents the annual benefit expenditure cost estimates for each membership population group over the projection period.

Table 4.11. NHIS benefit expenditure projections, 2023–32 (in Kwacha)

Year	Public sector	Private sector	Pensioners/ Older persons	Informal/Self-employed	Total
2023	265 387 489	349 384 028	222 744 029	243 335 826	1 080 851 373
2024	339 071 887	451 113 012	280 220 193	439 055 308	1 509 460 400
2025	388 585 456	514 947 034	307 104 739	644 052 233	1 854 689 462
2026	438 822 077	581 935 015	331 676 316	873 651 943	2 226 085 351
2027	493 260 800	653 801 786	356 861 888	1 129 857 980	2 633 782 453
2028	537 993 977	713 899 789	385 880 873	1 388 381 877	3 026 156 516
2029	585 719 462	777 870 147	417 909 150	1 668 984 674	3 450 483 433
2030	637 133 985	846 743 761	447 891 598	1 967 432 728	3 899 202 072
2031	692 588 856	920 507 693	484 996 806	2 288 351 590	4 386 444 946
2032	752 829 567	1 000 574 033	520 117 829	2 640 836 427	4 914 357 857

Source: NHIMA ILO/HEALTH Model – [BEN_EXP_HEALTHgt] Total health expenditure by population group (g,t).

An analysis of these projections indicates that the NHIS health benefit expenditure is expected to increase from 1.1 billion Kwacha in 2023 to 4.9 billion Kwacha in 2032. The biggest cost driver is the expected growth in the self-employed population, which in 2032 is expected to utilize 53.7 per cent of health services, up from 22.5 per cent in 2023.

4.3.4. Modelling of other NHIS expenditure

As part of modelling a holistic profile of the NHIS expenditure, other cost centres were noted, namely, general and administrative expenses incurred by NHIMA, as well third-party administrative fees payable to external vendors. The NHIS financial statements (table 4.12) present a profile of these expenses as incurred to date.

Table 4.12. NHIS financial statements, 2019–22 (in Kwacha '000s)

	2019	2020	2021	2022[1]
Revenues				
Contribution income	100 247	677 313	814 060	735 319
Investment income	188	33 291	177 471	153 294
Other revenues	0	2 335	4 138	7 154
Government grants	2 879	7 407	0	0
Total revenues	**103 314**	**720 345**	**995 668**	**895 766**
Expenditures				
NHIS benefit expenses	0	34 680	174 389	419 605
NHIS general and administrative expenses	4 743	41 066	67 301	67 846
Third-party administrative fees		144 833	158 000	118 500
Total expenditures	**4 743**	**220 579**	**399 689**	**605 951**
Net surplus/(deficit)	**98 571**	**499 767**	**595 979**	**289 815**

Note: [1] Based on NHIS management accounts for a nine-month period ending September 2022.

Source: NHIMA.

NHIS general and administrative expenses were also considered with respect to contribution income and to NHIS benefit expenses. These ratios are presented in table 4.13.

Table 4.13. Ratio of NHIS general expenditure to contribution income and benefit expenses, 2019–22 (percentages)

	2019	2020	2021	2022[1]
Ratio of NHIS general admin. expenses to contribution income	4.7	6.1	8.3	9.2
Ratio of NHIS general admin. expenses to NHIS benefit costs	n/a	118.4	38.6	16.2

Note:[1] Based on NHIS management accounts for a nine-month period ending September 2022.

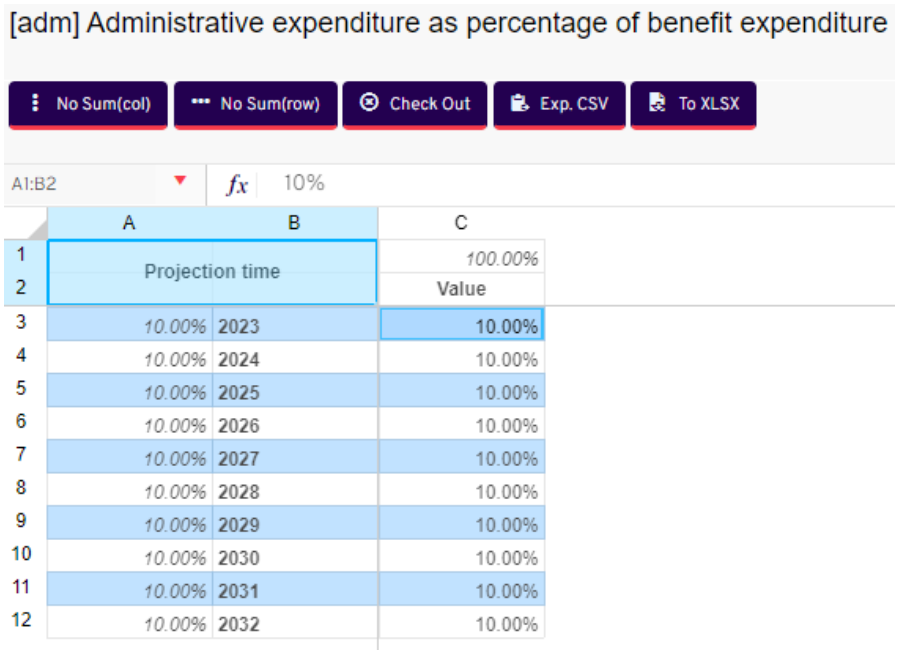
Source: NHIMA.

A review of the ratio of NHIS general and administrative expenses to contribution income was considered with due reference to Section 41(5) of the Act which prescribes a cap on the monies allocated towards administrative and management expenses, and Section 19 of SI 63 which stipulates a cap of 10 per cent of monies held by the NHIF to be spent on administrative and management expenses, in any year.

If Section 41(5) of the Act and Section 19 of SI 63 are interpreted to prescribe a 10 per cent cap on the ratio of NHIS general and administrative expenses to contribution income, NHIMA is found to be compliant with this requirement, with the observed ratios peaking at 9.2 per cent as at baseline date.

For ILO/HEALTH modelling purposes it is the second ratio (to benefit costs) that is of interest, as the administrative expenditure model inputs are defined as a percentage of benefit expenditure. From the NHIS experience review, it is noted that the ratio of general and administrative expenses to NHIS benefit expenses started at 118.4 per cent in 2020 and has rapidly reduced to 16.2 per cent at baseline date. Against this experience, a long-term assumption for the administration expenses to benefit expenditure ratio was set at 10 per cent, as depicted in the excerpt from the ILO/HEALTH Model (figure 4.6).

Figure 4.6. Administration expense ratio input assumptions (excerpt from the ILO/HEALTH Model)



Source: NHIMA ILO/HEALTH Model – [adm] Administrative expenditure as percentage of benefit expenditure (t).

This is considered a conservative assumption, as NHIS benefit expenditure is expected to increase faster than administrative expenses. This opinion is based on the observed NHIS benefit expenditure increases of 141 per cent over the 2021/22 cycle, whilst administrative expenses increased by only 1 per cent over the same period.

The NHIS third-party administrative fees were considered separately from the general and administrative expenses. The third-party administrative fees are time-bound contracts with external ICT contractors. The NHIS contractors identified are Zambia State Insurance Company Life Limited (ZSIC), Probase Limited and Infratel with contracts amounting to 790 million Kwacha, 16.3 million Kwacha and 0.5 million Kwacha respectively.[27] NHIMA does not expect to renew its major ICT contracts once they expire in 2025, but rather to undertake smaller contracts to complement the established ICT framework. Following engagements with NHIMA, and taking into account the fact that 421 million Kwacha has already been paid against existing contracts, the following schedule of Third-Party Administrative fees with respect to ICT services was adopted as an additional NHIS expenditure input assumption.

Figure 4.7. ICT third-party expense input assumptions (excerpt from the ILO/HEALTH Model, in Kwacha)

[OExp] Other Expenditure (external projection of absolute monetary values) (t).

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	A	B	C
1	Projection time		1,120,000,000.00
2			Value
3	160,000,000.00	2023	160,000,000.00
4	160,000,000.00	2024	160,000,000.00
5	160,000,000.00	2025	160,000,000.00
6	120,000,000.00	2026	120,000,000.00
7	120,000,000.00	2027	120,000,000.00
8	120,000,000.00	2028	120,000,000.00
9	80,000,000.00	2029	80,000,000.00
10	80,000,000.00	2030	80,000,000.00
11	80,000,000.00	2031	80,000,000.00
12	40,000,000.00	2032	40,000,000.00

Source: NHIMA ILO/HEALTH Model – [OExp] Other Expenditure (external projection of absolute monetary values) (t)

The evolution of the consolidated NHIS '*General and Administrative Expenses*' and '*Third-Party Administrative Fees*' over the projection period is presented in table 4.14.

[27] Socieux +, "Operational Review of the National Health Insurance Scheme in Zambia", Technical Report, 2022.

▶ **Table 4.14. Projection of NHIS general and third-party administration expenditure, 2023–32 (in Kwacha)**

NHIS expenditure	General administration	Third-party admin. fees	Total
2023	108 085 137	160 000 000	268 085 137
2024	150 946 040	160 000 000	310 946 040
2025	185 468 946	160 000 000	345 468 946
2026	222 608 535	120 000 000	342 608 535
2027	263 378 245	120 000 000	383 378 245
2028	302 615 652	120 000 000	422 615 652
2029	345 048 343	80 000 000	425 048 343
2030	389 920 207	80 000 000	469 920 207
2031	438 644 495	80 000 000	518 644 495
2032	491 435 786	40 000 000	531 435 786

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

4.4. NHIS claims modelling: Consistency review

It is vital to undertake a consistency check of the input data and the projected results to verify their integrity. The first step of the consistency review was to compare the NHIS claims data used to progress the above assumptions with the reported NHIS benefit expenditure in the financial statements, to assess the degree of alignment (table 4.15).

▶ **Table 4.15. Comparison of NHIS benefit expenditure (in Kwacha '000s)**

Evaluation period	NHIS claims data	NHIS financial statements	Difference	Discrepancy
Jan. 2021–Sept. 2022	675 393	593 994	81 399	12.1%

Source: NHIMA financial statements and author calculations.

This review indicates that the value of claims according to the NHIS *claims data* exceeds the reported benefit expenditure listed in the financial statements for the period January 2021 to September 2022, by 12.1 per cent. This variance emanates from the fact that the value of NHIS claims data is premised on approved claims, whilst the financial reports present paid claims. There is an operational time lag between claims being approved by the NHIMA Health Insurance Services Unit (responsible for claims management), and finally being paid by the NHIMA Finance & Investments Unit (responsible for financial transactions). The NHIMA Service Level Agreement (SLA) targets the payment of approved claims to be resolved in 30–45 days, although this standard is not always met. Against this perspective, the NHIS claims data were considered reliable.

To test the validity of the input assumptions and the effectiveness of model calibration, a secondary consistency test was undertaken to assess the capacity of the ILO/HEALTH Model to replicate the *actual* NHIMA benefit expenditure outcomes as at September 2022. This assessment was made against 27 of the 35 modelled interventions. Table 4.16 presents the outcome of this comparative exercise.

▶ Table 4.16. Comparison of actual vs. modelled NHIS benefit expenditure, at September 2022 (in Kwacha '000s)

Claim group	Claim group description	Modelled outcome	NHIS actual claims	Variance (%)
2630	Inpatient Hospitalization (IPD)	8 150 681	7 658 003	6.0
2631	Inpatient Dialysis (IPD)	9 799 531	10 112 341	-3.2
2632	Inpatient Maternity (IPD)	4 520 664	13 559 329	-66.7
2633	Inpatient Paediatrics (IPD)	263 099	831 512	-68.4
2634	Inpatient Oncology (IPD)	170 493	165 461	3.0
2635	Inpatient Optical (IPD)	44 081 431	39 296 008	10.9
2637	Mental Health (IPD)	297 624	303 911	-2.1
2638	Inpatient Minor Surgery (IPD)	1 375 296	1 337 460	2.8
2639	Inpatient Surgical Procedures (IPD)	1 805 312	1 671 187	7.4
2640	Inpatient Major Surgery (IPD)	5 189 432	4 771 087	8.1
2641	Inpatient Dental Procedures (IPD)	26 300 422	22 295 108	15.2
2642	Inpatient Orthopaedics (IPD)	938 895	931 071	0.8
2643	Outpatient Exercise Therapy (OPD)	5 266 590	5 147 044	2.3
2644	Inpatient Accommodation (IPD)	27 892 888	24 423 623	12.4
2648	Inpatient Blood & Blood Products (IPD)	5 356 759	5 386 105	-0.5
2649	Inpatient Prosthesis & Appliances (IPD)	512 977	529 482	-3.2
2650	Inpatient Pathology (IPD)	89 251	88 551	0.8
2651	Inpatient Radiology (IPD)	6 921 549	6 858 512	0.9
2652	Inpatient MR/ICT (IPD)	232 116	229 400	1.2
2670	Inpatient Ear, Nose, Throat (IPD)	203 319	193 118	5.0
2700	Private Pharmacy Drugs (OPD)	111 824 954	112 321 068	-0.4
2711	Outpatient Pathology (OPD)	39 093 136	37 725 422	3.5
2712	Outpatient Radiology (OPD)	47 329 415	44 723 799	5.5
2714	Outpatient Prosthesis & Appliances (OPD)	8 889 707	8 498 361	4.4
2720	Outpatient Optical Packs (OPD)	118 790 005	112 096 475	5.6
2730	Outpatient Dental (OPD)	21 783 703	19 916 264	8.6
2731	Outpatient MR/ICT (OPD)	15 120 121	14 734 180	2.6
	Total	**512 199 371**	**495 803 882**	**3.2**

Sources: NHIMA ILO/HEALTH Model – [EXPI] Annual Expenditure by health intervention, and NHIMA claims management data.

With the exception of health intervention groups *Inpatient Maternity* (claims code **2632**) and *Inpatient Paediatrics* (claims code **2633**), which cumulatively account for 2 per cent of total claim values, the ILO/HEALTH Model was able to produce modelling outcomes comparable to actual NHIS claims data.

Inpatient Maternity and *Inpatient Paediatrics* interventions both have the unique characteristic of being accessed by specified age and sex cohorts. *Inpatient Maternity* services have been modelled to restrict services to female beneficiaries only, covering the age bands 15–55 years. *Paediatric* services on the other hand have been modelled to restrict benefit access to beneficiaries aged below 15, consistent with the health service definitions.

The wide variance observed with respect to *Inpatient Maternity* and *Inpatient Paediatrics* is expected to result from a mismatch of the derived covered dependnt population profile assumptions and actual dependant population. As stated earlier, the NHIS has only registered less than 10 per cent of the dependant population. Whilst the population assumptions are able to reproduce credible results against interventions open to the general NHIS population, these assumptions are found lacking when focused on a sub-set of the insured population. Further, the raw *Inpatient Maternity* NHIS claims data applied to derive the utilization rates assumptions werenoted to also include males as well as females outside the fertility ages of 15–55 years. A similar challenge was noted with respect to *Inpatient Paediatrics*, where services were in some cases attributed to claimants above age 20. Whilst efforts were made to address the observed claims data deficiencies through data smoothing techniques, the resultant modelling outcomes have not effectively replicated the target outcomes.

Apart from these noted exceptions, the consistency of the majority of interventions was good, resulting in an overall variance of 3.2 per cent. Against this outcome, the input assumptions applied to the ILO/HEALTH Model were considered adequate to replicate the NHIS benefit expenditure.

An additional consistency review undertaken was to assess the variance of actual NHIS claims data (as at baseline date 2022), with the derived 2023 results, to consider the capacity of the ILO/HEALTH Model to produce credible annualized expenditure growth rate outcomes. This evaluation was applied to the eight health service interventions represented in Package 5 (table 4.17).

Table 4.17. Modelled annual expenditure growth experience, Package 5, 2022/23 (in Kwacha)

Intervention	Claim group description	Modelled outcome for 2023	NHIS actual claims (2022)	% growth rate
2645	Outpatient Initial Consultations (OPD)	199 896 261	151 044 337	24.4
2646	Outpatient Subsequent Consultations (OPD)	21 462 605	16 495 794	23.1
2647	Outpatient Chronic Consultations (OPD)	2 186 473	1 542 104	29.5
2654	Drugs (IPD & OPD)	137 313	30 876	77.5
2691	Inpatient Level One Consultation (IPD)	937 319	699 752	25.3
2692	Outpatient Level One Consultation (OPD)	11 452 210	8 666 042	24.3
2750	Antenatal Services (OPD)	1 494 395	955 653	36.1
2751	Antenatal Visits (OPD)	167 764	154 680	7.8
	Total	**237 734 339**	**179 589 238**	**24.5**

Sources: NHIMA ILO/HEALTH Model – [EXPI] Annual Expenditure by health intervention, and NHIMA claims management data.

The modelled 2023 health expenditure results reflect a positive growth rate outcome against all the intervention groups. The growth rate experience is different for all groups, indicative of the individualized utilization and unit cost growth rate assumptions applied. The overall annual benefit expenditure growth determined for this group of interventions is 24.5 per cent.

This analysis was extended to consider the cumulative growth of NHIS health benefit expenditure over the projection period (table 4.18).

▶ Table 4.18. NHIS benefit expenditure trends, 2021–32 (in Kwacha '000s)

Expenditures	2021[1]	2022[1]	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NHIS benefit expenses	174 389	419 605	1 080 851	1 509 460	1 854 689	2 226 085	2 633 782	3 026 157	3 450 483	3 899 202	4 386 445	4 914 358
NHIS administrative expenses	67 301	67 846	108 085	150 946	185 469	222 609	263 378	302 616	345 048	389 920	438 645	491 436
Third-party administrator fees	158 000	118 500	160 000	160 000	160 000	120 000	120 000	120 000	80 000	80 000	80 000	40 000
Total expenditures	**399 689**	**605 951**	**1 188 936**	**1 820 406**	**2 200 158**	**2 568 694**	**2 897 160**	**3 448 773**	**3 875 531**	**4 369 122**	**4 905 090**	**5 445 794**
Health benefit expenditure growth (%)	**403**	**141**	**158**	**40**	**23**	**20**	**18**	**15**	**14**	**13**	**12**	**12**

Note: [1]Based on NHIS financial reports (actual data).

Sources: NHIMA ILO/HEALTH Model – [EXPI] Annual Expenditure by health intervention, and NHIMA claims management data.

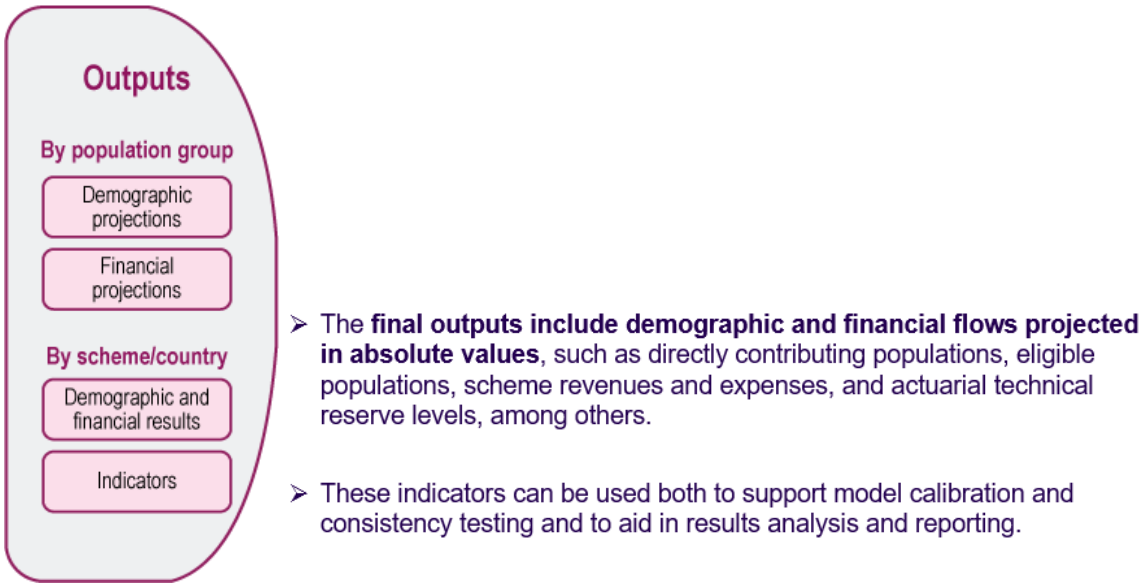
A review of this table indicates that the actual 2022 benefit expenditure and the modelled 2023 results yield comparable expenditure growth rates of 141 per cent and 158 per cent respectively, indicative of the expected increases in the short term. The longer-term health benefit expenditure growth outlook indicates a gradual decrease, consistent with the expectation that the NHIS will reach its optimal utilization carry over the projection period.

It is against these positive consistency review outcomes that the actuarial exercise proceeded to consider the interphase between modelled income and expenditure outcomes to assess NHIS sustainability, as described in Chapter 5.

5. Actuarial projections of the NHIS

This chapter takes a consolidated view of the NHIS *income* and *expenditure* projections, to consider the net impact on the sustainability of the scheme. With reference to the ILO/HEALTH Model, the chapter considers the final outputs inclusive of 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 (see figure 5.1). The input assumptions and data to drive these outcomes have been presented in the preceding chapters, notably Chapter 3 with respect to the demographic and income projections, and Chapter 4 with respect to NHIS expenditure.

Figure 5.1. Overview of the OUTPUT module of the ILO/HEALTH Model



Source: ILO/HEALTH Actuarial Model, *User Manual.*

5.1. Results of the NHIS demographic projections

To develop the demographic profile of the NHIS, the analysis first considered the active membership as at the baseline date of September 2022, as well as to project its future evolution.

The growth in NHIS coverage is driven largely by the projected increased participation of the self-employed workforce, as informed by the NHIMA Strategic Plan (2023–2026).[28] Against this strategy, NHIMA has set a target to register 80 per cent of the self-employed workforce by 2026, up from 6.7 per cent as at baseline date. The ILO/HEALTH Model has adopted a more conservative outlook, assuming a realized coverage of 52 per cent of the self-employed workforce as at the end of the projected period (2032). This more conservative assumption nonetheless translates in the growth of the self-employed membership from being the smallest contributory group in 2023 (representing 26 per cent of total contributory membership), to the largest in 2032 (representing 57 per cent of total contributory membership).

The assumed growth in the contributory participation with respect to the private and public sector membership is relatively flat due to the fact that the NHIS currently covers 90 per cent of the formal sector

[28] https://www.nhima.co.zm/download/document/6e0fa33fe6202303026b0a19cc.pdf.

(employed) labour force. The modelled ILO/HEALTH assumptions project a 4 per cent increase in formal sector coverage over the projection period to peak at 94 per cent.

Table 5.1 presents the expected evolution of the NHIS active contributory membership, over the projection period.

Table 5.1. Projection of NHIS contributory members, by sector, 2023–32

	Public sector	Private sector	Informal sector/ Self-employed	Total NHIS active membership
2023	452 021	550 124	349 030	1 351 174
2024	485 141	588 310	528 252	1 601 703
2025	520 381	625 605	719 470	1 865 455
2026	554 381	664 922	914 312	2 133 616
2027	590 257	706 362	1 114 803	2 411 422
2028	610 561	730 502	1 294 838	2 635 901
2029	631 563	755 466	1 474 575	2 861 605
2030	653 288	781 284	1 649 289	3 083 861
2031	675 761	807 984	1 822 165	3 305 910
2032	699 006	835 597	1 998 735	3 533 338

Source: NHIMA ILO/HEALTH Model – [Tactsg] Total Active Contributors; [PTT_MDAT] Table Main Demographic Aggregates.

Against this active membership, the quantum as well as the age and sex profile of the affiliated beneficiaries were also computed. The projected NHIS profile of dependants was developed from national statistics such as household size, likelihood of marriage, and fertility rates. Table 5.2 presents the main demographic aggregates of the NHIS for selected years between 2023 and 2032, as per the OUTPUT module of the ILO/HEALTH.

▶ Table 5.2. Projection of NHIS main demographic aggregates, by sex, selected years between 2023 and 2032

Main demographic aggregates table	Total population [TP]	Employed labour force [LF]	Active insured [Act Ins]	Pensioners	Dependants	Total insured [Total Ins]	Coverage rate (%)	
							[Act Ins] / [LF]	[Total Ins] / [TP]
Total	[a]	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[c]/[b]	[f]/[a]
2023	20 287 543	6 998 877	1 351 174	1 210 277	4 233 667	6 795 118	19.3	33
2026	22 461 282	8 482 226	2 133 616	1 248 730	6 393 063	9 775 409	25.2	44
2029	24 867 982	9 664 870	2 861 605	1 282 726	8 426 180	12 570 510	29.6	51
2032	27 532 615	10 697 413	3 533 338	1 308 742	10 311 124	15 153 205	33.0	55
Female								
2023	10 357 983	2 817 340	352 178	601 118	2 369 505	3 322 800	12.5	32
2026	11 484 081	3 482 111	598 952	623 402	3 573 434	4 795 787	17.2	42
2029	12 732 606	3 995 708	855 131	643 446	4 690 043	6 188 620	21.4	49
2032	14 116 868	4 430 113	1 120 889	659 486	5 702 082	7 482 457	25.3	53
Male								
2023	9 929 560	4 181 536	998 996	609 159	1 864 162	3 472 318	23.9	35
2026	10 977 201	5 000 115	1 534 663	625 329	2 819 630	4 979 622	30.7	45
2029	12 135 376	5 669 162	2 006 474	639 279	3 736 137	6 381 890	35.4	53
2032	13 415 747	6 267 300	2 412 449	649 257	4 609 042	7 670 747	38.5	57

Source: NHIMA ILO/HEALTH Model – [PTT_MDAT] Table Main Demographic Aggregates.

According to these ILO/HEALTH demographic outputs, the *total insured population* of the NHIS is projected to grow from 6.8 million in 2023 to reach 15.2 million in 2032. This translates to an increase in coverage from 33 to 55 per cent.

Table 5.3 presents the expected health benefit expenditure to be generated by the various population groups.

▶ **Table 5.3. Projection of NHIS benefit expenditure, by sector and group, 2023–32 (in Kwacha)**

Year	Public sector	Private sector	Pensioners/ Older persons	Informal/Self-employed	Total
2023	265 387 489	349 384 028	222 744 029	243 335 826	1 080 851 373
2024	339 071 887	451 113 012	280 220 193	439 055 308	1 509 460 400
2025	388 585 456	514 947 034	307 104 739	644 052 233	1 854 689 462
2026	438 822 077	581 935 015	331 676 316	873 651 943	2 226 085 351
2027	493 260 800	653 801 786	356 861 888	1 129 857 980	2 633 782 453
2028	537 993 977	713 899 789	385 880 873	1 388 381 877	3 026 156 516
2029	585 719 462	777 870 147	417 909 150	1 668 984 674	3 450 483 433
2030	637 133 985	846 743 761	447 891 598	1 967 432 728	3 899 202 072
2031	692 588 856	920 507 693	484 996 806	2 288 351 590	4 386 444 946
2032	752 829 567	1 000 574 033	520 117 829	2 640 836 427	4 914 357 857

Source: NHIMA ILO/HEALTH Model – [BEN_EXP_HEALTHgt] Total health expenditure by population group (g,t).

5.2. Results of the NHIS financial projections

Several NHIS income output scenarios were subsequently considered against the standard demographic and expenditure context presented above.

5.2.1. NHIS financial projections – Scenario A: Baseline

The first scenario considered (table 5.4) was to evaluate the sustainability of the NHIS in its current format against the contribution rate (2 per cent of basic earnings with respect to the formal sector, and 1 per cent of declared earnings by the self-employed), adjusted for the increasing membership and coverage (as per section 5.1 above), as well as earnings growth assumptions (as outlined in section 3.5.5 above).

▶ **Table 5.4. Projection of NHIS financial results, baseline, scenario A, 2023–32 (in Kwacha millions)**

Year	Contribution income	Investment income	Total revenue	Benefits expenditure	Administrative expenditure	Other expenditure	Total expenditure	Net income
2023	1 197.52	279.86	1 477.38	1 080.85	108.09	160	1 348.94	128.44
2024	1 344.17	266.67	1 610.84	1 509.46	150.95	160	1 820.41	-209.57
2025	1 485.94	223.4	1 709.34	1 854.69	185.47	160	2 200.16	-490.82
2026	1 644.55	156.37	1 800.92	2 226.09	222.61	120	2 568.69	-767.77
2027	1 816.94	65.06	1 882.00	2 633.78	263.38	120	3 017.16	-1 135.16
2028	1 986.01	0	1 986.01	3 026.16	302.62	120	3 448.77	-1 462.76
2029	2 142.03	0	2 142.03	3 450.48	345.05	80	3 875.53	-1 733.50
2030	2 309.55	0	2 309.55	3 899.20	389.92	80	4 369.12	-2 059.57
2031	2 484.29	0	2 484.29	4 386.44	438.64	80	4 905.09	-2 420.80
2032	2 673.15	0	2 673.15	4 914.36	491.44	40	5 445.79	-2 772.64

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

The baseline scenario is indicative of the fact that the NHIS in its current format is not financially sustainable. The evaluated trend shows that NHIS expenditure is increasing at a faster rate than income. The

total revenue of the NHIS is anticipated to grow by 83 per cent over the projection period, from 1.48 billion Kwacha in 2023 to 2.67 billion Kwacha in 2032. Conversely, the NHIS expenditure is projected to grow by 304 per cent, from 1.35 billion to 5.45 billion Kwacha over the same period.

The NHIS is expected to realize an operating surplus in 2023 only, and in the following years realize an ever-increasing deficit. Fortunately, the scheme has accumulated technical reserves amounting to 1.5 billion Kwacha as at September 2022. It is these reserves that the scheme will deploy to address the income and expenditure mismatch. It is worth highlighting the fact that the scheme has since commenced applying its reserves to counter the liquidity mismatch between contribution income and health benefit expenditure. **The NHIS reserves are projected to be exhausted by 2026**, when the reserve balance will become negative (see table 5.5). The negative balances accrued against the reserve account are indicative of the funding deficit that the NHIS will accumulate. If unchecked, the scheme will accumulate a funding deficit of 16 billion Kwacha at the end of the projection period, as shown in table 5.5.

▶ Table 5.5. Projection of reserve balance of the NHIS, baseline, scenario A, 2022–32 (in Kwacha millions)

	NHIS reserve balance
2022	1 484
2023	1 531
2024	1 218
2025	608
2026	-298
2027	-1 597
2028	-3 316
2029	-5 511
2030	-8 294
2031	-11 766
2032	-15 994

Source: NHIMA ILO/HEALTH Model – [REST] Reserve Fund Balance.

It is evident from the above scenario that there is need to increase the contributory rates of the NHIS to ensure that the scheme revenue can keep pace with expenditure. The scheme pay-as-you-go (PAYG) rate was considered in a bid to assess the target contribution levels required to attain this operational balance. The PAYG ratio considers the *total cost of scheme expenditure* against the *insurable earnings base*, to give an indication of the required contribution rate. The outcome of the PAYG analysis is presented in table 5.6.

▶ Table 5.6. Projection of PAYG of the NHIS, 2022–32

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
PAYG rate	2.04	2.46	2.65	2.77	2.92	3.07	3.19	3.32	3.46	3.56

Source: NHIMA ILO/HEALTH Model – [RPT_TRE_Q_TFR_C] PAYG Rate.

A review of these results indicates that the NHIS should apply an increasing contribution rate starting from 2.04 per cent in 2023 and increasing to 3.56 per cent in 2032, against the insurable earnings of *all* contributing members. It is worth highlighting that the current contribution rate of 2 per cent of basic earnings is applied to the formal (public and private) sector membership only, whilst the self-employed sector has a 1 per cent levy on declared income. The *effective contribution rates* realized by the NHIS against the baseline scenario (2 per cent formal sector and 1 per cent self-employed) was calculated and compared to the PAYG rate (table 5.7).

Table 5.7. Effective contribution rate of the NHIS, baseline, scenario A, compared to the PAYG rate, 2022–32 (in Kwacha)

	Salary mass	Contribution income	Effective contribution rate (%)	Calculated PAYG rate (%)
2023	66 196 459 249	1 197 523 387	**1.8**	2.04
2024	74 100 111 013	1 344 169 302	**1.8**	2.46
2025	82 996 198 565	1 485 939 518	**1.8**	2.65
2026	92 660 940 001	1 644 554 860	**1.8**	2.77
2027	103 189 820 574	1 816 936 065	**1.8**	2.92
2028	112 226 692 621	1 986 007 151	**1.8**	3.07
2029	121 640 923 282	2 142 029 109	**1.8**	3.19
2030	131 570 051 633	2 309 550 373	**1.8**	3.32
2031	141 903 287 597	2 484 292 081	**1.8**	3.46
2032	152 970 297 063	2 673 150 295	**1.7**	3.56

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure

From this review, the *effective contribution* rates realized by the NHIS baseline scenario are below the PAYG ratio, resulting in the projected funding deficits. There is a marginal drop in the effective contribution rate at the end of the projection period due to the increasing dominance of self-employed workers who are contributing at a lower rate than their formal sector peers.

5.2.2. NHIS financial projections – Scenario B: 3 per cent formal sector contribution

The second scenario considered was to evaluate the sustainability of the NHIS against an increased contribution rate from 2 to 3 per cent levied against the formal (public and private) sector employees only. The rationale for this focus on the formal sector is guided by NHIMA Management's interest to consider scenarios with a higher likelihood of successful implementation.

The inconsistent contribution profile evidenced from the self-employed workers makes any contribution increase initiatives levied against this group fraught with uncertainty, more so as their affiliation to the NHIS has in practice been voluntary. Despite this voluntary association, the self-employed members and their dependants remain a significant health expenditure cost driver for the scheme.

An analysis of the NHIS financial projections against the increased income projections (3 per cent of formal sector basic earnings), effective in 2025, and the standardized NHIS health benefit expenditure projection is presented in table 5.8.

Table 5.8. Projection of financial results of the NHIS, 3 per cent formal sector contribution rate, scenario B, 2023–32 (in Kwacha millions)

Year	Contribution income	Investment income	Benefits expenditure	Administrative expenditure	Other expenditure	Net income
2023	1 198	280	1 081	108	160	128
2024	1 344	267	1 509	151	160	-210
2025	2 183	263	1 855	185	160	246
2026	2 406	284	2 226	223	120	121
2027	2 650	298	2 634	263	120	-69
2028	2 889	289	3 026	303	120	-271
2029	3 109	254	3 450	345	80	-513
2030	3 346	192	3 899	390	80	-831
2031	3 595	93	4 386	439	80	-1 218
2032	3 864	0	4 914	491	40	-1 582

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

The effective date of the prospective contribution rate change was set at 2025, as NHIS contribution rate changes are effected via legislative amendment, with due reference to Section 15 of the Act, as well as Section 9 and the Third Schedule of SI 63. Such legislative changes will necessarily require lead time to undertake the requisite stakeholder engagements and solicit Executive Government endorsement.

A review of the revised NHIS income and expenditure projections indicates an improved financial performance by the scheme, with the operating deficit re-emerging again in 2027.

The revised evolution of the NHIS reserve position under this 3 per cent contribution rate was also considered (table 5.9).

Table 5.9. Projection of reserve balance of the NHIS, 3 per cent formal sector contribution rate, scenario B, 2022–32 (in Kwacha millions)

	NHIS Reserve balance
2022	1 484
2023	1 537
2024	1 237
2025	1 384
2026	1 392
2027	1 193
2028	775
2029	100
2030	-915
2031	-2 338
2032	-4 198

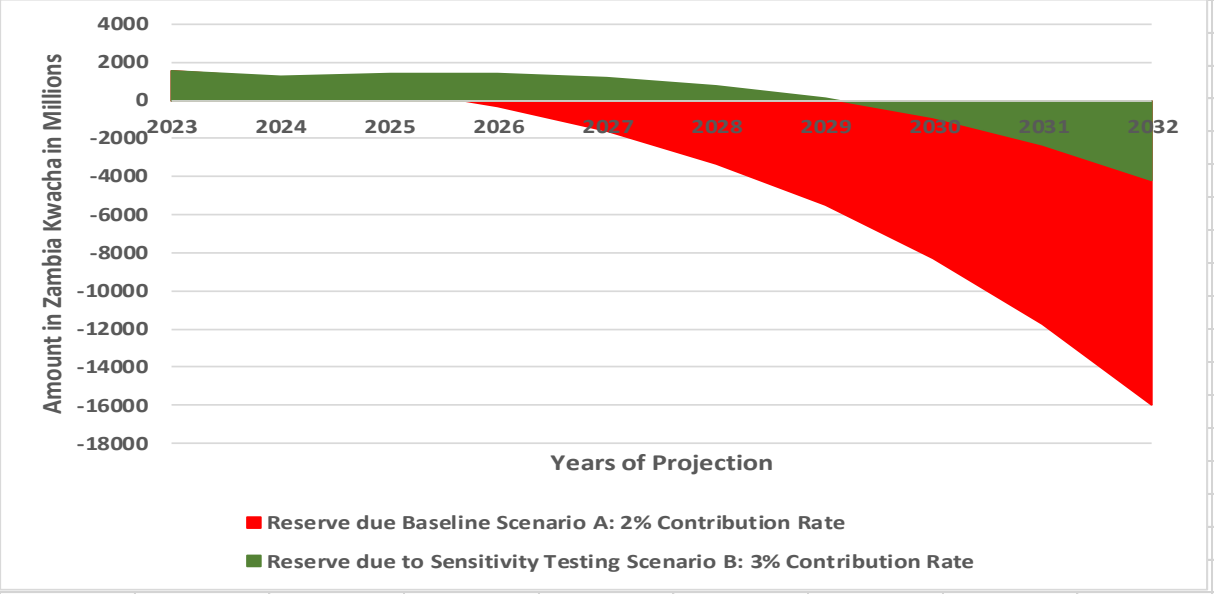
Source: NHIMA ILO/HEALTH Model – [REST] Reserve Fund Balance.

This review indicates that the NHIS reserves will be able to cover the operational deficits that materialize in 2026, through to 2030 when they become exhausted. If unchecked, the NHIS will accumulate a 4.2 billion Kwacha deficit by 2032.

The conclusion reached is that the modelled 3 per cent formal sector contribution rate is not sufficient to deliver a financially sustainable NHIS over the projection period.

Figure 5.2 presents a comparison of the NHIS reserve funding positions realized by the baseline scenarios A (2 per cent contribution rate) and B (3 per cent contribution rate).

Figure 5.2. Projection of reserve balance of the NHIS, scenarios A and B, 2022–32 (in Kwacha millions)



Sources: NHIMA ILO/HEALTH Model – [REST] Reserve Fund Balance, and author depiction.

The effective NHIS contribution rate realized by Scenario B was further considered for adequacy against the established PAYG rate.

Table 5.10. Projection of effective contributions to the NHIS, 3 per cent formal sector contribution rate, scenario B, compared to PAYG rate, 2023–32 (in Kwacha)

	Salary mass	Contribution income	Effective contribution rate	Prescribed PAYG rate
2023	66 196 459 249	1 197 523 387	**1.8**	2.04
2024	74 100 111 013	1 344 169 302	**1.8**	2.46
2025	82 996 198 565	2 182 887 246	**2.6**	2.65
2026	92 660 940 001	2 406 471 899	**2.6**	2.77
2027	103 189 820 574	2 650 087 622	**2.6**	2.92
2028	112 226 692 621	2 888 986 429	**2.6**	3.07
2029	121 640 923 282	3 108 892 876	**2.6**	3.19
2030	131 570 051 633	3 346 218 931	**2.5**	3.32
2031	141 903 287 597	3 594 614 802	**2.5**	3.46
2032	152 970 297 063	3 864 125 431	**2.5**	3.56

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

From this review, it is evident that whilst there is an increase in the effective contribution rate from 1.8 per cent to 2.6 per cent, this adjustment is not sufficient to keep track with the PAYG rate across the projection period.

5.2.3. NHIS financial projections – Scenario C: 4 per cent formal sector contribution

The third scenario considered was to evaluate the sustainability of the NHIS against an increased contribution rate from 2 to 4 per cent, again levied against the formal (public and private) sector employees only. The evolution of the NHIS financial results against this income scenario, and the standard expenditure profile, are presented in table 5.11.

Table 5.11. Projection of financial results of the NHIS, 4 per cent formal sector contribution rate, scenario C, 2023–32 (in Kwacha millions)

Year	Contribution income	Investment income	Benefits expenditure	Administrative expenditure	Other expenditure	Net income
2023	1 198	280	1 081	108	160	128
2024	1 344	267	1 509	151	160	-210
2025	2 880	299	1 855	185	160	978
2026	3 168	402	2 226	223	120	1 001
2027	3 483	515	2 634	263	120	981
2028	3 792	622	3 026	303	120	965
2029	4 076	724	3 450	345	80	924
2030	4 383	820	3 899	390	80	833
2031	4 705	903	4 386	439	80	703
2032	5 055	971	4 914	491	40	580

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

A review of the modelled income and expenditure outcomes against the 4 per cent contribution rate indicates that the NHIS is able to attain financial sustainability across the duration of the projection period (table 5.12).

Table 5.12. Projection of reserve balance of the NHIS, 4 per cent formal sector contribution rate, scenario C, 2022–32 (in Kwacha millions)

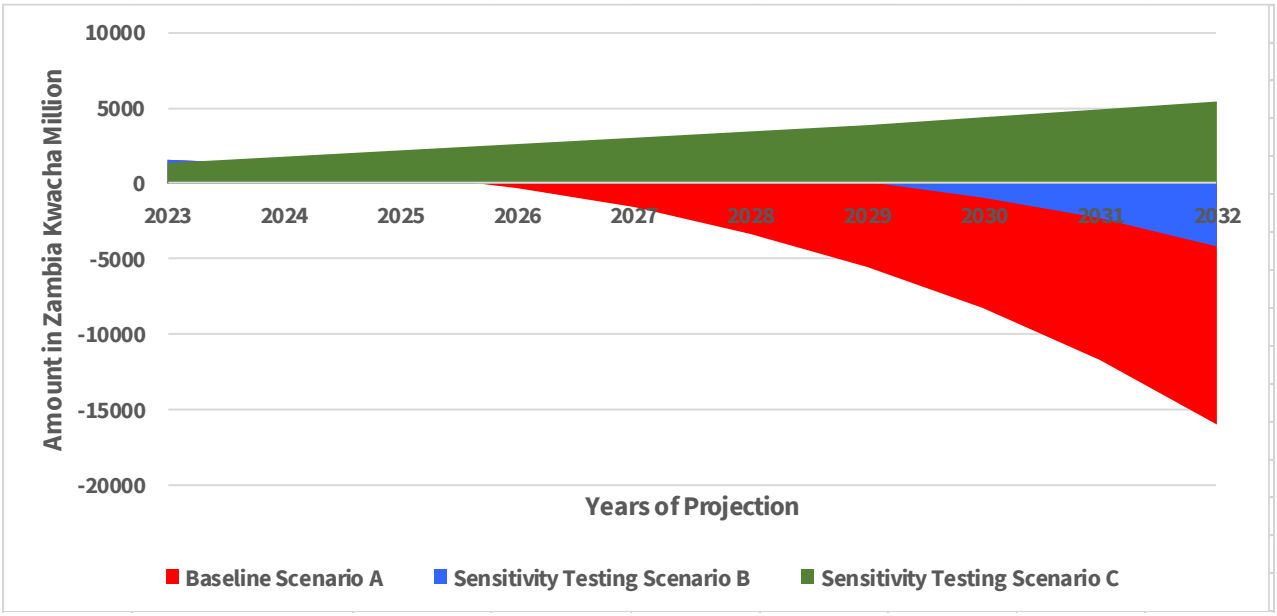
	NHIS reserve balance
2022	1 484
2023	1 531
2024	1 218
2025	2 077
2026	2 940
2027	3 758
2028	4 536
2029	5 251
2030	5 848
2031	6 287
2032	6 573

Source: NHIMA ILO/HEALTH Model – [REST] Reserve Fund Balance.

A review of the NHIS reserve balance against this contribution rate (scenario C) allows for a positive balance to be maintained throughout the projection period.

Figure 5.3 presents a comparison of the funding positions realized by the baseline scenarios A (2 per cent contribution rate), B (3 per cent contribution rate) and C (4 per cent contribution rate).

Figure 5.3. Projection of reserve balance of the NHIS, scenarios A, B and C, 2022–32 (in Kwacha millions)



Sources: NHIMA ILO/HEALTH Model – [REST] Reserve Fund Balance, and author depiction.

Another key consideration was to assess how effectively this contribution rate matched the PAYG rate, to ensure that the NHIS funding level was set optimally (table 5.13).

Table 5.13. Projection of effective contributions to the NHIS, 4 per cent formal sector contribution rate, scenario C, compared to PAYG rate, 2022–32 (in Kwacha)

	Salary mass	Contribution income	Effective contribution rate	Prescribed PAYG rate
2023	66 196 459 249	1 197 523 387	**1.8**	2.04
2024	74 100 111 013	1 344 169 302	**1.8**	2.46
2025	82 996 198 565	2 879 834 974	**3.5**	2.65
2026	92 660 940 001	3 168 388 939	**3.4**	2.77
2027	103 189 820 574	3 483 239 179	**3.4**	2.92
2028	112 226 692 621	3 791 965 707	**3.4**	3.07
2029	121 640 923 282	4 075 756 643	**3.4**	3.19
2030	131 570 051 633	4 382 887 489	**3.3**	3.32
2031	141 903 287 597	4 704 937 523	**3.3**	3.46
2032	152 970 297 063	5 055 100 567	**3.3**	3.56

Source: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure.

This review indicates that the effective contribution level achieved by scenario C is adequate to meet the PAYG NHIS funding requirements throughout the projection period.

Another indicator worthy of consideration is the *funding ratio*, to confirm that the contribution rate has not been set too high thus allowing the NHIS to accumulate excessive reserves. As introduced earlier, the funding ratio considers the size of the reserves relative to the total annual expenditure of the NHIS**.** A funding ratio of 1 is indicative of the capacity of the NHIS to meet the health expenditure benefit obligations for one year, outside of any income being received. *The optimal funding ratio of health insurance schemes depends upon numerous factors, including the size of the scheme, the experienced stability (depth of historic operational data) of its benefit expenditure, and the realistic period within which a contribution rate change can be effected. The funding ratio of health schemes typically varies between a coefficient of 0.25 and 1, or even higher*.[29]

The review of the NHIS funding ratio against scenario C is presented in table 5.14.

[29] Cichon et al. *Modelling in Health Care Finance*.

▶ Table 5.14. NHIS funding ratio at 4 per cent formal sector contribution rate, scenario C, 2021–32

Year	Funding ratio
2021[1]	2.99
2022[1]	2.45
2023	1.14
2024	0.67
2025	0.94
2026	1.14
2027	1.25
2028	1.32
2029	1.35
2030	1.34
2031	1.28
2032	1.21

Note: [1]Based on NHIS management accounts and financial reports.

Source: NHIMA ILO/HEALTH Model – [RPT_TFR] Table Financial Results.

From this review, the 4 per cent contribution rate revision sees the NHIS reverse the funding ratio decline post 2022 to peak at 1.35 in 2029, with a gradual subsequent decrease. This range of funding ratio is considered adequate to cushion the NHIS against unexpected expenditure shocks, taking into account the lead time of two to three years required to effect a contribution change, as elucidated above.

5.2.4. Evaluation of contribution equity

It is worth highlighting that the alternative scenarios considered to increase the NHIS contribution capacity are based solely on additional contributions levied against the participating formal (public and private) sector employees. Without discounting the rationale put forward by NHIMA for considering these financing scenarios B and C as the most feasible in terms of execution, the actuarial analysis was completed with additional analysis to elucidate the contribution equity of the NHIS. The starting point of this analysis was to determine the average *annual* contribution of each membership group, as presented in table 5.15.

▶ Table 5.15. Projection of average annual contributions, baseline, scenario A, by sector, 2023–32 (in Kwacha)

	Public sector	Private sector	Informal sector/ Self-employed
2023	1 140.9	1 160.2	124.9
2024	1 158.5	1 218.8	123.2
2025	1 177.5	1 248.6	127.9
2026	1 212.8	1 280.5	132.0
2027	1 249.1	1 315.2	135.1
2028	1 308.8	1 378.3	139.1
2029	1 353.8	1 427.9	141.3
2030	1 402.1	1 481.4	143.2
2031	1 452.2	1 533.8	144.7
2032	1 505.8	1 591.0	145.7

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

From this review, it is noted that a participating formal (public and private) sector employee contributes an average of approximately 1,300 Kwacha per annum over the projection period, which translates to a monthly contribution of 108 Kwacha per month. A self-employed worker contributes an average of approximately 135 Kwacha per annum, which translates to 11 Kwacha per month.

According to the 2021 Zambia Labour Force Survey,[30] monthly formal sector average earnings were 6,441 Kwacha, whilst average monthly earnings for the self-employed were 2,191 Kwacha. As such, the calculated NHIS average contributions constitute 1.7 per cent of formal sector average earnings, and 0.5 per cent of self-employed average earnings as at baseline date. This indicates that self-employed workers fail even to meet the 1 per cent contribution thresholds, on account of inconsistent contributions.

Additional analysis was undertaken to consider the total health benefit consumption of each contributory membership group against the total number of contributing members, to determine the average utilization benefit costs per member (inclusive of their dependants). This outcome is presented in table 5.16.

[30] ZamStats, *2021 Zambia Labour Force Survey*, 2022. https://www.zamstats.gov.zm/publications/.

▶ Table 5.16. Projection of average annual health benefit utilization amounts, by contributing member and by sector, 2023–32 (in Kwacha)

	Public sector	Private sector	Informal sector/ Self-employed
2023	587.1	635.1	697.2
2024	698.9	766.8	831.1
2025	746.7	823.1	895.2
2026	791.6	875.2	955.5
2027	835.7	925.6	1 013.5
2028	881.1	977.3	1 072.2
2029	927.4	1 029.7	1 131.8
2030	975.3	1 083.8	1 192.9
2031	1 024.9	1 139.3	1 255.8
2032	1 077.0	1 197.4	1 321.3

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

From this analysis, the self-employed are consuming a marginally higher cost in health services compared to their contributing peers. Their annual average cost of benefits per household of 697.20 Kwacha (in 2023) is higher than the average annual contribution 124.90 Kwacha (with reference to table 5.15 above). Formal (public and private) sector employees, on the other hand, are contributing more than they are consuming against all scenarios as modelled.

The insurance and solidarity principles of social security do consider subsidization. This is in fact embedded in the NHIS with respect to pensioners/older persons, whose participation under current rules is non-contributory as mandated by law. As a consequence, the NHIS initiative on expansion of coverage has to give careful scrutiny to the embedded cross-subsidization elements.

This is an especially important consideration with respect to the self-employed population, who play a central role in expanding the NHIS contributory base over the projection period. NHIMA's efforts to increase the on-boarding of this group should be cognizant of the associated health benefit costs and ensure that this evolution is duly matched with increased revenues. Table 5.17 depicts the monthly cost of carry for the respective contributory groups. In addition to assessing the capacity and willingness to pay of the self-employed population group, subsidization through tax-funded sources should be considered to ensure adequate protection of all beneficiaries.

▶ **Table 5.17. Projection of monthly benefit cost per household, by sector, 2023–32 (in Kwacha)**

	Public sector	Private sector	Informal sector/ Self-employed
2023	48.9	52.9	**58.1**
2024	58.2	63.9	**69.3**
2025	62.2	68.6	**74.6**
2026	66.0	72.9	**79.6**
2027	69.6	77.1	**84.5**
2028	73.4	81.4	**89.4**
2029	77.3	85.8	**94.3**
2030	81.3	90.3	**99.4**
2031	85.4	94.9	**104.7**
2032	89.7	99.8	**110.1**

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

5.2.5. Evaluation of NHIS expenditure in the national context

To review the validity of the nominal NHIS health benefit expenditure projections, these outcomes were referenced against the national GDP estimates. As described in section 1.2.2 above, the national economy is expected to realize gradual annual growth from the current level of 2.9 per cent at baseline date, to peak at 5 per cent at the end of the projection period. The nominal GDP figures realized against this evolution are presented below, and duly referenced against the NHIS health benefit expenditure to yield the associated ratios table 5.18).

▶ **Table 5.18. Projection of NHIS health benefit expenditure amounts and as a percentage of GDP, 2022–32**

	National GDP (Kwacha)	NHIS health benefit expenditure (Kwacha)	NHIS health benefit expenditure as % of GDP
2022[1]	426 661 000 000	675 393 120	0.16
2023	443 727 440 000	887 065 430	0.20
2024	462 363 992 480	1 101 380 968	0.24
2025	483 632 736 134	1 331 984 805	0.28
2026	506 847 107 469	1 583 400 070	0.31
2027	532 189 462 842	1 863 378 717	0.35
2028	558 798 935 984	2 134 370 901	0.38
2029	586 738 882 783	2 429 155 923	0.41
2030	616 075 826 922	2 742 070 533	0.45
2031	646 879 618 269	3 083 400 450	0.48
2032	679 223 599 182	3 453 525 057	0.51

Note: [1]Based on NHIS management accounts, and IMF WEO.

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

A review of these ratios indicates a projected increase of NHIS health benefit expenditure as a percentage of GDP from 0.16 per cent in 2022 based on actual data, to 0.51 per cent as at 2032 as per the modelled outcomes. These NHIS ratios were also compared to central government health expenditure (as a percentage of GDP) which is reported at 13.9 billion Kwacha, 3 per cent of GDP. These national funds represent the allocation to the Ministry of Health and are mainly geared towards health service provision by the public health system.[31] The comparison of NHIS health benefit expenditure to central government and public health expenditure profiles yields plausible outcomes.

[31] UNICEF, "Zambia Health Budget Brief", 2022. https://www.unicef.org/esa/media/11336/file/UNICEF-Zambia-Health-Budget-Brief-2022.pdf.

6. Costing of extension to SCT beneficiaries

As part of the NHIS actuarial analysis, additional scenarios were specifically dedicated to costing the extension of coverage to the poor and vulnerable. Section 16(c) of the Act mandates the participation of the poor and vulnerable in the NHIS, albeit on a non-contributory basis. The identification of persons classified as *poor and vulnerable* in terms of the Act is to be undertaken by the Ministry responsible for social welfare. To apply Section 16(c), the recipients of the Zambia *Social Cash Transfer* (SCT) programme, as administered by the Ministry of Community Development and Social Services (MCDSS), are interpreted to constitute the *poor and vulnerable*.

6.1. Analysis of SCT membership data

The SCT membership data as supplied by MCDSS were considered to determine the age and sex profiles to inform the costing exercise. The primary SCT membership was determined to be 974,160 as at valuation date. The SCT data, as received, had deficiencies mainly related to incomplete data fields and/or missing entries. To address these deficiencies, two unique SCT data sets were harnessed through specific queries to the Zambia Integrated Social Protection Information System (ZISPIS) and consolidated to create a unified membership file. ZISPIS is the membership register and electronic payment system deployed to administer the SCT programme. Duplicate entries were merged to enhance the depth of required descriptive fields, and data smoothing techniques applied to address the residual deficits. It is recommended that the ZISPIS SCT data base is improved to allow for a smooth data exchange with the NHIS in future.

From this analysis, five distinct SCT sub-categories were recognized (table 6.1).

Table 6.1. SCT membership categories

Membership category	Number of members
Older persons	162 855
Disabled	129 211
Palliative care	31 221
Child-headed household	3 435
Female-headed household	647 160
Total	**974 160**

Sources: MCDSS data and author calculations.

Further analysis was undertaken to disaggregate the SCT membership data by *age* and *sex*. SCT membership was found to be skewed towards females (who constitute 75 per cent of the total) as shown in table 6.2.

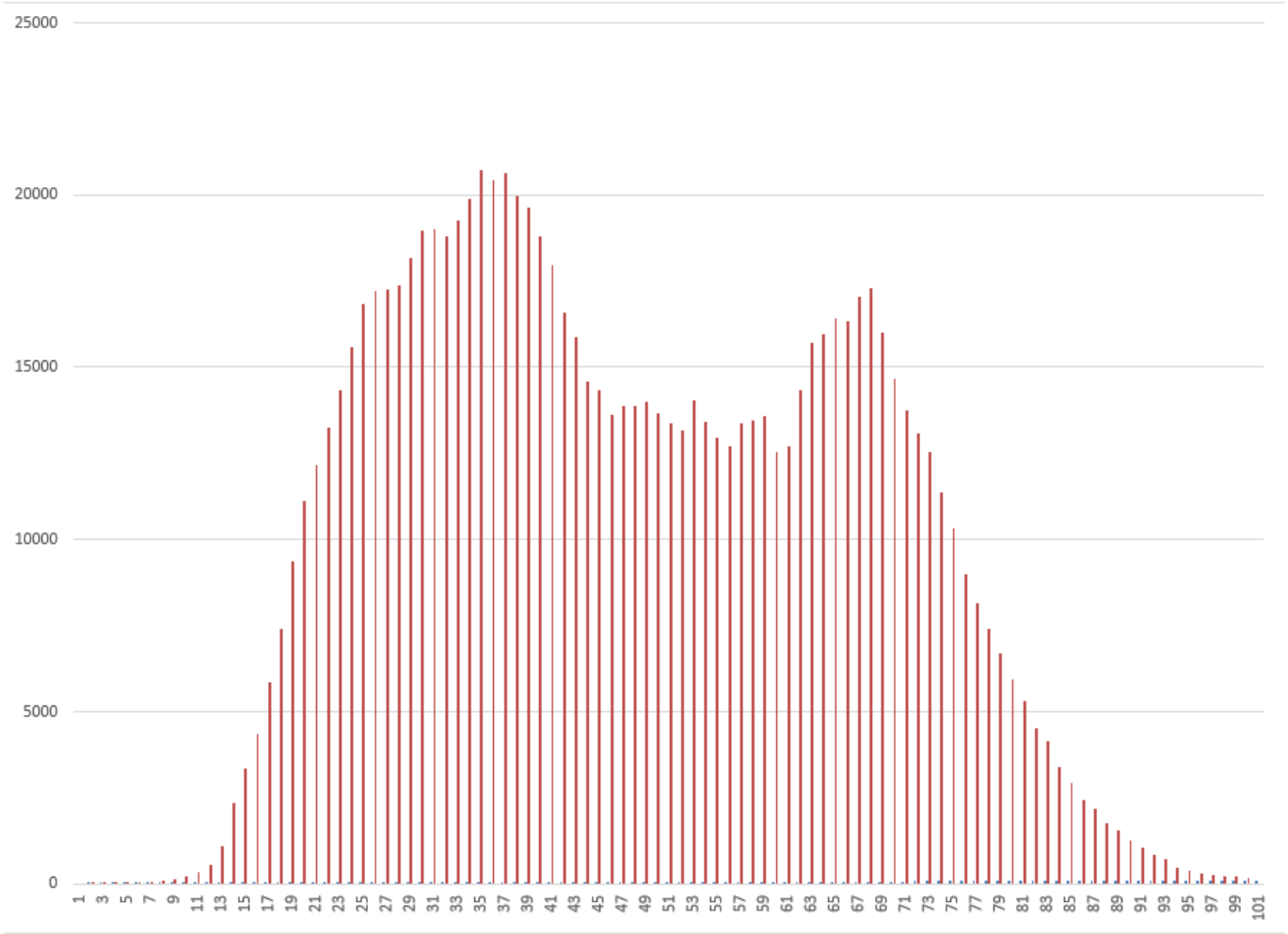
Table 6.2. SCT membership, by sex

	Male	Female
SCT membership	246 903	727 255

Sources: MCDSS data and author calculations.

The SCT membership age profile is presented in figure 6.1.

▶ Figure 6.1. SCT membership, by age, at September 2022



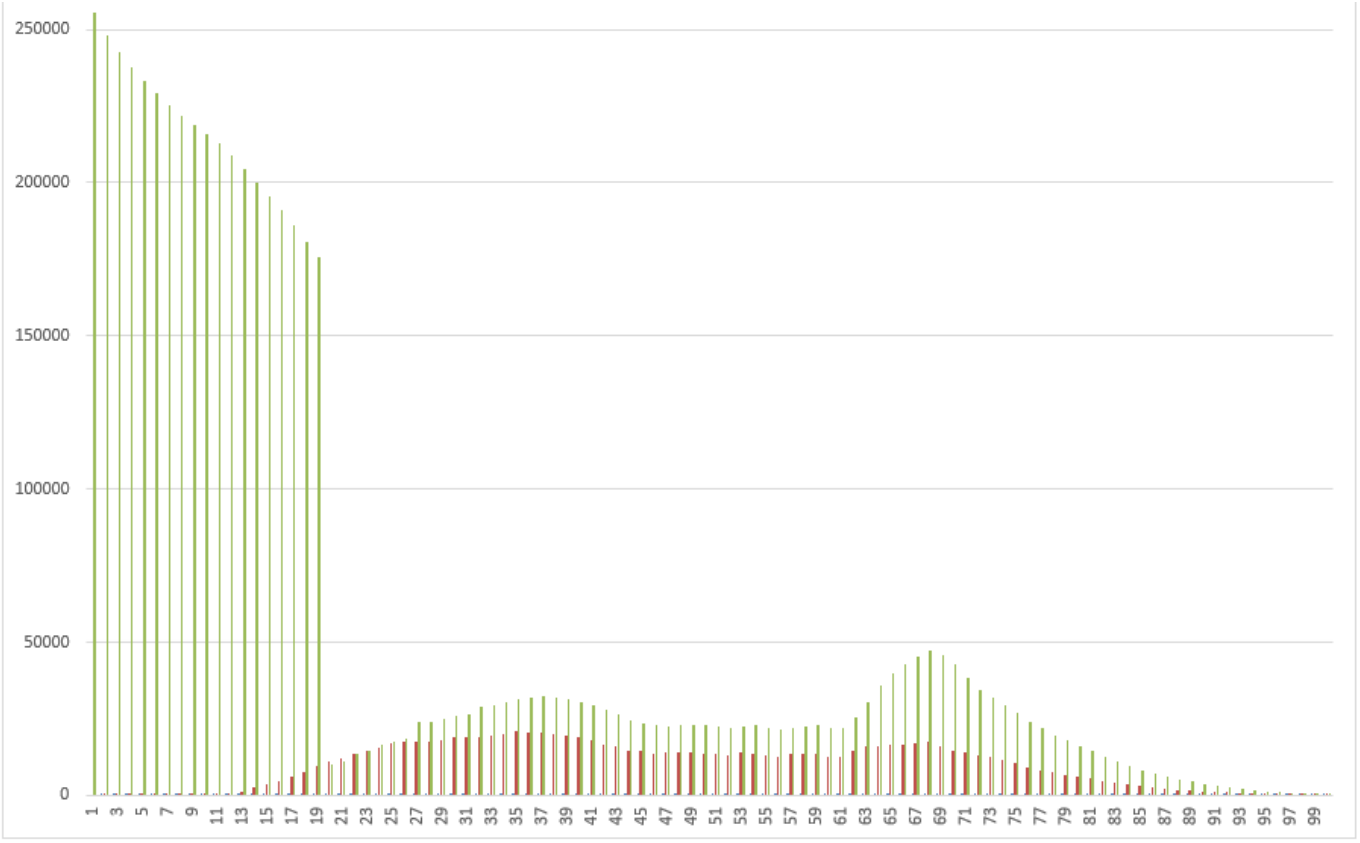
Sources: MCDSS data and author calculations.

SCT membership peaks in the age band 30–40, reflects the dominance of the 'female-headed household' membership category. The age band 65–70 represents another peak, reflecting the significant representation of older persons.

Similar to the current rules applied to NHIS active members, the participation of SCT primary members will also be extended to their families (that is, one spouse and up to five dependent children under age 18). The profile of SCT households, was developed by applying the same methodology used to generate the dependants profile for NHIS contributor membership: considering the national census population profile, national marriage statistics, household size, and total fertility rates. The total SCT beneficiary population projected from this application is 5,785,802.

Figure 6.2 presents an overlay of the age profile of the main SCT participants and the total SCT household beneficiary population as at September 2022.

▶ **Figure 6.2. Main SCT participants and total SCT household beneficiary population, by age, at September 2022**



Sources: MCDSS data and author calculations.

6.2. SCT health benefit costs

NHIMA estimates that total SCT membership is expected to reach 1.375 million by 2032, a total SCT beneficiary population of 8,164 million. Given the practical logistical considerations, the NHIS is unable to on-board all the SCT members and their households in one exercise. NHIMA has therefore adopted a phased on-boarding aiming to register 10 per cent of the SCT beneficiary population per year, as shown in table 6.3.

▶ **Table 6.3. Proposed SCT on-boarding schedule, 2023–32**

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
% SCT in NHIS	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
Total SCT members	137 450	274 900	412 350	549 800	687 250	824 700	962 150	1 099 600	1 237 050	1 374 500

Sources: NHIS data and author calculations.

The ILO Social Protection Floors Recommendation, 2012 (No.202)[32] recognizes the strategic relevance of a "progressive" realization of the right to social security, which is consistent with the NHIS phased on-boarding strategy. The national stakeholders will however need to establish the criteria for prioritizing SCT households for on-boarding. Priority consideration can possibly be given to those participants on palliative care and the disabled, whose health needs are urgent.

The NHIMA proposed SCT on-boarding schedule was subsequently applied against the ILO/HEALTH Model to generate the NHIS health benefit costs of the group. It is assumed that SCT households will access the standard NHIMA Health Package. As such, the health expenditure benefit costs of the SCT households were premised on NHIS utilization rates and costs as applied to the self-employed population. In the absence of national data on SCT health usage patterns, the NHIS health service utilization pattern of the self-employed population was applied as a proxy.

The utilization rate of SCT beneficiaries will need to be closely monitored since the socio-economic profile of a group influences its epidemiological profile, which may translate into utilization patterns that differ from the current portfolio of NHIMA.

The SCT health service costs were modelled using two scenarios defined by NHIMA: one that restricts access to *public health service facilities only*, and the other a mixed offering allowing access to both *public and private health facilities*. It should be recalled that the ILO encourages the application of the same benefit package for all NHIMA beneficiaries to guarantee equity and non-discrimination.

These health benefit costs were finally projected against the phased on-boarding schedule to be applied by NHIMA. Table 6.4 presents the anticipated health expenditure benefit costs of SCT households for the phased on-boarding programme.

▶ Table 6.4. Modelling of SCT coverage and health expenditure costs, 2023–32 (in Kwacha)

Year	No. of SCT households	Total no. of SCT beneficiaries	Cost - public health facilities only	Cost - private & public health facilities
2023	137 450	578 580	48 816 490	74 056 316
2024	274 900	1 202 290	120 565 766	184 102 782
2025	412 350	1 873 768	202 967 661	306 353 791
2026	549 800	2 595 794	298 189 837	449 410 486
2027	687 250	3 371 287	408 466 480	615 207 669
2028	824 700	4 203 321	535 574 262	807 005 802
2029	962 150	5 095 125	682 208 402	1 028 187 630
2030	1 099 600	6 050 097	850 919 638	1 282 607 228
2031	1 237 050	7 071 807	1 044 439 287	1 574 278 912
2032	1 374 500	8 164 009	1 266 088 936	1 908 355 829

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

[32] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:3065524.

The health expenditure costs of the expansion of NHIS coverage to SCT participants and their households are targeted to reach 1.3 billion Kwacha in 2032 in the access to public health services *only* scenario, and 1.9 billion Kwacha in the access to *both* public and private health facilities scenario, resulting in a 50 per cent cost differential.

6.2.1. Evaluating the NHIS cost of carry per SCT household

Against the above health benefit expenditure projections, it is important for NHIMA to assess the cost of carry per SCT household. The annual health expenditure was therefore assessed against the projected number of registered SCT households to yield the expected annual cost per household, which was subsequently transformed to a monthly rate. These SCT costs were determined with reference to restricted access to public health services only, as well as a mix of both public and private health facilities. Table 6.5 presents the calculated cost of carry for SCT households, duly referenced against the comparative costs determined for existing contributor membership groups.

Table 6.5. Comparison of average monthly benefit costs per household, selected NHIS membership groups, 2023–32 (in Kwacha)

	Public sector employees	Private sector employees	Self-employed workers	SCT (public health facilities only)	SCT (public & private health facilities)
2023	48.9	52.9	58.1	**29.6**	**44.9**
2024	58.2	63.9	69.3	**36.5**	**55.8**
2025	62.2	68.6	74.6	**41.0**	**61.9**
2026	66.0	72.9	79.6	**45.2**	**68.1**
2027	69.6	77.1	84.5	**49.5**	**74.6**
2028	73.4	81.4	89.4	**54.1**	**81.5**
2029	77.3	85.8	94.3	**59.1**	**89.1**
2030	81.3	90.3	99.4	**64.5**	**97.2**
2031	85.4	94.9	104.7	**70.4**	**106.1**
2032	89.7	99.8	110.1	**76.8**	**115.7**

Sources: NHIMA ILO/HEALTH Model – [RPT_TRE] Table Revenue and Expenditure, and author calculations.

An analysis of these results indicates that the calculated cost of carry for SCT households is comparable to the peer membership groups. The SCT household cost of carry for access to public health facilities only yields the lowest trends, consistent with expectations.

As at 2023, a total monthly subsidy of 29.60 Kwacha per SCT household would be sufficient to meet the NHIMA health benefit funding cost for health services supplied by public health facilities only. The cost of carry is expected to escalate annually against utilization cost and frequency increases, reaching 76.80 Kwacha at the end of the projection period. Where SCT access is open to both private and public health providers, the required subsidy is estimated to start from 44.90 Kwacha in 2023 to reach 115.70 Kwacha in 2032. It is expected that this subsidy is sourced from the Treasury or financed directly by taxes. The inclusion of the SCT in the NHIS without corresponding external financial support will result in a worsening of the financial sustainability of the scheme.

It is worth highlighting that these estimates are explicit to health expenditure costs only, and do not consider administrative costs yet, which may vary according to the choices established for the phased on-boarding. NHIMA will have to develop an explicit and costed on-boarding programme which can exploit the already existing MCDSS and ZISPIS operative systems for administering SCT benefits, to minimize the NHIS extension of coverage costs.

7. Conclusion and recommendations

The actuarial analysis of the National Health Insurance Scheme was performed as of 30 September 2022. This chapter presents a summary of the key findings and related conclusions, as well as specific policy recommendations.

7.1. Summary of key findings

The analysis employed the ILO/HEALTH Actuarial Model through its embedded methodology to review the actuarial and financial situation of the NHIS. The model was adjusted to adapt to the specific situation of the NHIS. The ILO/HEALTH Model is based on adequate methodologies, coherent with international actuarial standards and accepted actuarial practice.

The NHIS is a relatively new scheme which commenced operations in 2019. In consequence, the availability of sufficient and reliable data specific to membership and contribution income, as well as health benefit and administrative expenditure, were in some cases insufficient. This required extensive efforts by NHIMA to undertake multiple data collection, quality analysis and assurance exercises in order to deliver sufficiently robust outputs. Overcoming the data deficiencies with respect to health benefit expenditure was particularly challenging where the review period was subsequently reduced to a 21-month period (January 2021 to September 2022).

NHIMA is strongly advised to continually update primary and dependant membership records and enhance the synchronization of internal ITC platforms to improve the statistics and performance monitoring capacities of the NHIS. Further, NHIMA must increase interaction with the Ministry of Health and the public health system to improve the mapping of national disease and health service statistics against which the NHIS experience can be benchmarked.

In addition to these data capacity and performance management investments, it is recommended that the NHIS undertake an annual actuarial valuation exercise to revise assumptions and extend the operational reference period. In the case of new schemes, ISAP 2 recommends that future actuarial exercises should follow in a short period of time, given the volatility of the main scheme parameters such as the rates and costs related to the use of health services, as well as the revenues realized.

An actuarial exercise requires several hypotheses. The hypotheses adopted in this exercise have been agreed with national stakeholders, notably NHIMA and MCDSS, who participated in the results validation workshop in March 2023. They are based on the relatively short experience of the NHIS and were deemed to be appropriate both individually and collectively.

In the next actuarial valuation, it will be relevant to verify and adapt as necessary the hypotheses adopted in the current exercise, taking into account the additional NHIS experience registered, and the new developments with respect to social insurance and health policies in Zambia. Nevertheless, it is important to state that the goal of an actuarial valuation is not to precisely forecast the exact development of income and expenditure of the scheme, but to analyse its financial sustainability over the projection period (2023 to 2032).

From this analysis, the NHIS in its current form is *not* sustainable over the 10-year projection period of 2023 to 2032.

The baseline scenario (A) shows that, under current circumstances, the expenditure on health benefits and administration costs will outpace the revenue generated from contributions and investments in 2024, with the NHIS realizing an operational deficit of 209.57 million Zambian Kwacha.

Under current circumstances, expenditure is forecast to grow by 304 per cent over the projection period (from 1.35 billion Kwacha in 2023 to 5.45 billion Kwacha in 2032), whilst revenue is expected to increase by only 83

per cent (from 1.48 billion Kwacha in 2023 to 2.67 billion Kwacha in 2032). This mismatch of revenue and expenditure will erode the NHIS reserves, valued at 1.5 billion Kwacha as of September 2022. These reserves will be completely exhausted by 2026. Unless corrective action is taken, the NHIS will accumulate a funding deficit of 16 billion Kwacha by 2032.

The PAYG rate of the NHIS increases over the projection period from 2.04 per cent (2023) to 3.56 per cent (2032), whilst the effective contribution rate under the current rules fluctuates between 1.7 and 1.8 per cent over the same period. This means that the current NHIS contribution rates are far below the levels required to keep the regime in balance. Corrective action needs to be taken to restore sustainability.

Against this background, two scenarios were considered to increase NHIS contributions. The first scenario (B) evaluated the impact of an increase in contributions by participating formal sector employees from the current rate of 2 per cent to 3 per cent, effected in the year 2025. This scenario, as evaluated, does not ensure NHIS sustainability over the projection period. It instead delays the realization of an operational deficit until 2027, whilst accumulated reserves are forecast to be depleted by 2030, and thereafter the NHIS will accumulate a funding deficit of 4.2 billion Kwacha by 2032.

Whist the effective contribution rate realized through this adjustment would increase and oscillate between 2.5 and 2.6 per cent, it remains below the required PAYG rates of 2.65 to 3.56 per cent for the period 2025–32.

The other scenario (C) simulated an increase in the contribution rate of formal workers from the current 2 per cent to 4 per cent, to be applied as of 2025. Such a scenario does not avoid the operational deficit anticipated in 2024, but it does result in a recovery of operational surplus that is sustained over the whole of the projection period through to 2032. In this scenario (C), the effective contribution rate realized through this change is equivalent to the required PAYG rate in almost all years of the projection period. The scenario realizes a funding ratio (reserves compared to annual expenditure) that is slightly above 1 in most years of the projection. It is important to mention that a funding ratio of 1 is within the recommendations of actuarial practice.

It is worth highlighting that the contribution rate adjustments, as simulated, are premised on "*basic earnings*", as per Section 9 of SI 63. Reference was made to peer national social security agencies to confirm their contribution basis to consider possibilities for alignment. The National Pension Scheme Act No. 40 of 1996 and the Workers Compensation Act No. 10 of 1999 both prescribe that contributions are to be levied against "*earnings*". Whilst the National Pension Scheme Act does not explicitly define this term, the Workers Compensation Act defines "*earnings*" as the "*average remuneration of a worker*". It may be worthwhile for the national social security agencies to establish a standardized wage basis on which to levy contributions.

Another difference noted between the national social security agencies is the procedure to effect contribution rate changes to ensure scheme sustainability. Section 14(4) of the National Pension Scheme Act empowers the National Pension Scheme Management Authority (NAPSA), to prescribe the requisite rate, as determined via an actuarial valuation. A similar dispensation is accorded to the Workers Compensation Fund Control Board, as per Section 27(1) of the Workers Compensation Act. In contrast, the contribution rates of the NHIS are set by the Minister of Labour and Social Security, as per Section 15(5) of the Act. The rationale for the differentiated approaches to secure scheme sustainability is unclear, and standardization of this key procedure can be contemplated.

The projected growth of the NHIS is expected to be primarily driven by increased participation of the self-employed workforce as informed by the NHIMA Strategic Plan (2023–2026). In Zambia, self-employed workers are in practice affiliated to the NHIS on a voluntary basis, and as such present an intermittent contribution pattern. There is need to reconsider the NHIMA membership policy with respect to the self-employed in a bid to counter adverse selection risks, as well as to promote contribution income consistency. Measures to incentivize a steadier contribution profile by the self-employed can include matching contribution subsidies from the Treasury to this group (as adopted by several other developing countries), and/or transforming the

self-employed from voluntary into mandatorily insured (as per Section 13 of the NHI Act and as recommended by the ILO coverage extension approach); these are policy topics to be discussed in future.

Section 15 of the NHI Act exempts specified groups from contributing to the scheme. This exemption includes citizens or established residents above the age of 65 and disabled persons without the capacity to work, as well as the poor and vulnerable.

This analysis exercise had an explicit objective to quantify the additional funding required to on-board the poor and vulnerable to the NHIS. Registered beneficiaries of the national Social Cash Transfer programme have been interpreted to constitute the poor and vulnerable, as defined in the Act.

With regard to the prospective registration of the poor and vulnerable, NHIMA has opted for a phased on-boarding exercise. The actuarial results indicate that at full carry of the SCT households numbering 1.4 million in 2032, the associated NHIS liabilities are expected to reach 1.9 billion Kwacha. The cost of carry for each SCT household is expected to evolve from 45 Kwacha per month in 2023 to 116 Kwacha per month in 2032 for access to both public and private healthcare service providers. This costing outcome is expected to inform policy dialogue engagements to confirm viable funding options available to the NHIS to finance the on-boarding of the poor and vulnerable.

A similar liability schedule is currently being carried by the NHIS in respect of health benefit expenditure costs for pensioners and persons aged 65 above who are participating on a non-contributory basis, without any explicit funding arrangement. From global experience, it is not uncommon for pensioners to contribute to health insurance against the value of the pension earned, or for the scheme to apply alternative financing arrangements. NHIMA needs to also consider how this group of older persons/pensioners can benefit from explicit funding support due to their higher needs for medical services than the general population.

7.2. Summary of NHIS policy recommendations

In order to achieve NHIMA's contribution to the national policy goal of universal health coverage (UHC) in a financially and socially sustainable manner, guaranteeing the financial sustainability of the scheme, the ILO recommends the following in light of the actuarial analysis exercise conducted by NHIMA.

7.2.1. Strategy

A strategy for the extension of coverage should be developed and guide the extension process. While starting with the formally employed was a low-hanging fruit and efforts to try to include populations with no contributory capacity such as those under the SCT scheme is a matter of priority, a holistic strategy to extend coverage to the entire population is needed. In line with the ILO Social Protection Floors Recommendation, 2012 (No. 202) access to essential healthcare should be provided to all as a matter of priority. Further, this extension is the only way to align with the principles of broad risk pooling, effective solidarity and risk sharing amongst the population. Many countries have opted for contributory systems limited to the formally employed and subsidized systems for the poor, and have realized that this created a missing middle which could not be reduced without conscious strategic efforts in this direction.

7.2.2. Scheme design

- **Move to household-based enrolment with simultaneous registration of dependants.**

The Social Protection Floors Recommendation, 2012 (No. 202) highlights that basic social security guarantees, including access to essential healthcare, should be provided at a minimum to all residents and children as a matter of priority. The NHIS scheme managed by NHIMA is mandatory for all citizens and established residents above 18 in Zambia as per the NHI Act No. 2 of 2018. However, this legal guarantee does not yet translate into effective coverage, even for workers in the formal economy. The actuarial analysis has highlighted a low number of registered dependants in comparison to the average household size in Zambia. Among several factors,

enrolment in the NHIS is currently person-based, which means that a principal member must register first and then only declare dependants after his or her personal registration. Due to this rule, most dependants are not yet registered. **Moving to a household-based enrolment procedure will allow the NHIS to register all beneficiaries simultaneously – and thus to extend the scheme's effective coverage more rapidly in line with the 2018 Act.** Further, household-based registration can support a reduction in the risk of adverse selection, which currently can materialize for those in the informal sector. While the law provides for mandatory registration to the scheme, a passive registration strategy renders membership in practice voluntary, which can undermine the equity and sustainability of the scheme.

- **Review the Benefit Package based on evidence.** According to the 2018 Act, the Benefit Package is very broadly defined.

    a. *Range of services*. The initial design of the Benefit Package in 2019 was informed by the national health Strategic Plan, by the burden of diseases, and in consultation with relevant stakeholders. However, for services and medical interventions, the Act does not provide clear guidance on mechanisms or conditions to review the Benefit Package. For drugs, generic medicines should be used. The Act also does not mention a periodic review of the package, as prescribed by the ILO Social Security (Minimum Standards) Convention, 1952 (No. 102).[33] In line with and beyond the minimum range of services prescribed in this Convention, NHIMA's package currently includes medical care (consultations, examinations, diagnostic services (radiology and laboratory)), nursing care, hospitalization, intensive care unit), surgery (general surgery, anaesthetics, orthopaedics, paediatric surgery, ear, nose and throat), maternity (antenatal, delivery, caesarean section, postnatal care) and neonatal care, eye care (selected services), oral health care (selected services), pharmaceutical drugs and supplies as well as physiotherapy. NHIMA's operational manual further informs the composition of the Benefit Package. It includes registration and consultation, pharmaceutical services and blood products, investigations, surgical services, inpatient care services, physiotherapy and rehabilitation services, spectacles, dental and oral services, and medical/denture/orthopaedic appliances. It seems that consultation broadly refers to both general and specialized care. However, *domiciliary visiting* (specialized care outside of hospitals) does not seem to be included, contrary to the prescriptions of the ILO Medical Care and Sickness Benefits Convention, 1969 (No. 130). The operational manual also specifies a detailed list of exclusions, including public health care services funded under government or donor vertical programmes, epidemics and disasters, services for cosmetic purposes or treatment abroad. Attention must be paid to adequate coordination between excluded services and NHIMA's package itself. In particular, the lack of investment in preventive care outside the scheme may eventually impact curative care under the scheme. A detailed claims analysis should be conducted with a view to analyse the responsiveness of the Benefit Package to population needs across the demographic and income characteristics of the different groups covered by the scheme. The main cost drivers should also be analysed in light of the disease burden. More broadly, it would be important to have a coordinated strategy at national level for the sustainable financing of an integrated benefit package.

[33] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C102.

i. The national burden of diseases shows that the top ten causes of disability-adjusted life years (DALYs)[34] in Zambia are inclusive of human-immunodeficiency virus (HIV), tuberculosis (TB) and malaria, which are not prioritized for redress within the scope of NHIMA's package. The national effort against these diseases is still largely reliant on externally funded programmes, which will need to be sustained by national resources in due course.

ii. The other major causes of DALYs in Zambia, including maternal and neonatal conditions, diarrhoeal diseases, congenital anomalies and iron-deficiency anaemia, relate to conditions that require preventive strategies that are for the most part reliant on a strong and effective provision of primary healthcare services, which may also be beyond the scope of NHIMA's current reach (see 'Network of service providers' below).

b. *Level of financial protection.* No mention of co-payments is made for any of the intervention types. ILO Convention No. 102 indeed precludes cost-sharing for maternity care. For other types of interventions, co-payments may be authorized as a way to preclude abuse if they are designed so as to avoid hardship. However, there is evidence from low- and middle-income countries that co-payments, however small, can act as a financial barrier to accessing health services. It is therefore recommended that in case NHIMA considers introducing co-payments for selected services, they should be designed with the utmost care and with due consideration of the type of interventions concerned. In particular, only those interventions for which there is an actual risk of patient-induced over-consumption should be considered. In this respect, monitoring claims, analysing claims data on a routine basis, and having a dashboard of key indicators with an early warning system should be considered.

c. *Network of service providers*.

The present study did not encompass an assessment of the adequacy of the size of the network of service providers. Still, it will be important to do so as NHIMA plans for further expansion of population coverage, to ensure that people can effectively avail themselves of their benefits in adequately equipped facilities close to home.

Healthcare services are free of charge at primary level in public health posts and health centres of rural areas and therefore out of the scope of NHIMA's role as a purchaser. Yet a number of academic studies have shown that the population tends to bypass those facilities and directly access hospital services due to quality and availability issues. This is further reinforced by drug procurement issues that are reportedly affecting public facilities more than private ones. In many countries the absence of an effective gate-keeping role at primary level has led to inefficient and costly use of higher levels of care. NHIMA covers most of services available at district, central and provincial hospitals, as well as teaching and specialized hospitals. Both public and private providers are included, yet the list of services and their cost coverage differ for private providers. The list also does not specify which types of pathologies are included, but mostly types of services (consultations/laboratory tests, and so on). Managing private providers, whose increase in number and regulation can fluctuate, can be a challenge for many newly created social

[34] WHO, "Top 10 Causes of DALY in Zambia for Both Sexes Aged All Ages", 2000. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/global-health-estimates-leading-causes-of-dalys.

health insurance institutions in low- and middle-income countries. Appropriate empanelment and accreditation methods as well as control and audit need to be in place, and the scheme needs to use adequate provider payment methods (see the recommendations on operations in section 7.2.3 below).

d. *Alignment with ILO standards*. A comparative analysis between the NHI Act and relevant ILO instruments, especially the Social Security (Minimum Standards) Convention, 1952 (No. 102), can support guiding the extension strategy of NHIMA and alignment would strengthen the legal basis for the schemes, which eventually impacts its sustainability over time.

A careful analysis of the existing Benefit Package and its cost drivers, including between public and private providers, is recommended to inform future revision to rationalize its composition and ensure financial sustainability in the medium term. The ILO does not recommend applying different benefit packages to different population groups as a valid cost containment strategy, as this would be inequitable and has often proven inefficient. Indeed, having a number of different benefit package entitlements covering many different groups can become particularly difficult to manage, as it would create risks of adverse cross-subsidization and would render claims management more complex.

- **Review contribution rates.** The actuarial analysis shows that the current contribution rate levels are not adequate to ensure the financing of the scheme in the short term. Moving forward, contribution rate reviews should also consider possible revisions to the Benefit Package informed by the detailed claims analysis. Any potential increase in the contribution rate should be thoroughly discussed with the NHIMA board.

a. The analysis noted that the pensioners/older persons group is currently unfunded under the scheme (no contribution is made either by themselves or on their behalf), which is unsustainable over the long term, especially considering the impact of demography on health spending. While cross-subsidization amongst groups is possible, it is crucial that each group be financed.

b. For workers in the informal sector, a careful analysis of contributory capacities and willingness to pay should be undertaken to set an acceptable level of contributions. Moreover, a review of contribution collection modalities (payment schedules and modalities) should be undertaken to identify and remove possible obstacles to a further extension of coverage and enhance awareness among eligible populations. These measures will help in facilitating enrolment and limiting dropouts. In addition, it should be clear that additional NHIS subsidization from general taxation will most probably be required to ensure that those with no or limited contributory capacities can be adequately protected. Contribution rates and subsidization mechanisms should be designed in such a way that all those with insufficient contributory capacities, whether in the formal and informal sector, have access to adequate coverage so as to avoid creating informality traps and facilitate transitions from the informal to the formal economy that can contribute to reducing decent work deficits and enhancing productivity.[35]

[35] ILO, *Extending Social Security to Workers in the Informal Economy: Lessons from International Experience*, 2021. https://www.social-protection.org/gimi/RessourcePDF.action?id=55728

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- **Move towards a proactive registration strategy to implement the mandatory coverage prescribed in the law, and adapt registration and contribution collection modalities for those in the informal sector.**

  a. The NHI Act already provides for the mandatory nature of enrolment for all citizens and established residents over 18. Yet triggering effective coverage of those in the informal sector requires adopting a proactive registration strategy and establishing adapted registration, contribution collection and financing modalities.

  b. The current passive registration strategy risks exposing the scheme to adverse selection. More efforts should be undertaken in this respect, based on evidence and consultations with the concerned groups.

  c. *This requires an assessment of the characteristics and circumstances of the uncovered potential members, both those operating in the informal sector (self-employed workers and wage workers), as well as those who are informally employed in the formal sector (undeclared employment).* This includes gaining an in-depth understanding of the diversity of these people in terms of occupation, periodicity of income generation, localization and organization modalities, as well as ability and willingness to pay for social health insurance, and their perceptions and expectations thereof. Such evidence is the basis of a robust strategy to increase the take-up rate of workers and their families in the informal sector, as well to reach those who are still not covered in the formal sector. It can also inform decisions regarding both the design of the scheme and further quantitative analysis. Indeed, in the present actuarial analysis the basis for setting the assumptions on the take-up rate for those in the informal sector is weak due to the lack of evidence in this respect. Therefore, in order to meet the ambitious target NHIMA has set itself in this respect, to mitigate the risk of adverse selection, and to make the 2018 Act a reality, the development of an evidence base on those in the informal sector, as well as on still uncovered workers in the formal sector, and a robust strategy to expand coverage to these groups, is urgently needed.

7.2.3. Operations of NHIMA

- **Improve awareness-raising through strengthened communication**. Communicating widely to the population of Zambia about rights and entitlements to the scheme will be key to supporting a proactive strategy on registration of dependants (currently covered but unregistered) and those still uncovered, including those in the informal sector. It is equally crucial to secure that registered persons can access health services. **To that effect, it is recommended to develop a communication strategy relying on behavioural insights and adapted to the different population groups covered by NHIMA**. Such communication can also be a good channel for targeted health promotion as well as to support people in navigate their different entitlements (such as free primary care in public health posts and health centres of rural areas, single-disease programmes, and benefits under NHIMA).

- **Improve the scheme monitoring and evaluation system.** Careful monitoring of utilization rates, as well as a proper analysis of the collected data, are required. Indeed, while national statistics have proved helpful in making assumptions on prospective utilization rates, actual monitoring of utilization rates is absolutely necessary for the correct administration of the scheme. This is particularly important in the first years of operation, because when people become covered their utilization patterns tend to change (which is a positive sign of the scheme's effectively allowing enhanced access to healthcare services, but can also require an in-depth analysis of who is benefiting most and for which type of services). **This should be part of broader efforts to improve the monitoring of NHIMA's providers network and as part of quality assurance reforms.** This includes the need to develop a dashboard

containing key performance indicators related to: (i) the covered population, including all protected persons (active contributors, dependants, and so on); ii) the Benefit Package (including demand for services, utilization and unit cost of healthcare interventions); and iii) financing sources and expenditure (contributions from members and their employers, transfers from the Government, among others). This dashboard will be absolutely essential to inform the day-to-day management of the scheme, spot where additional analysis is needed, secure a robust data source for further actuarial analysis and mitigate the risks of adverse selection, cost escalation and fraud.

- **Strengthen data ownership and review agreement with third-party administrators.** The extensive efforts deployed to obtain an extraction of NHIMA's database of members and claims for the purpose of the actuarial analysis exercise show that there are still important systemic changes that should be made to improve the availability and readiness of data for monitoring and, eventually decision-making purposes. Reviewing contractual arrangements with NHIMA's third-party administrators (TPAs) should be a first step to ensuring that data warehousing arrangements do not stand in the way of the scheme's monitoring needs. Further, the current expenditure on the TPAs needs to be limited to keep administrative costs much lower than claims expenditure, which should be at the heart of the scheme. It is indeed of utmost importance that NHIMA gains ownership of the data records and stores these in-house. **It is therefore recommended to develop internal data warehousing and an internal monitoring system,** combining membership and contribution data from TPAs but also importantly claims, financial data and costings of services, and to build consolidated dashboards including additional inputs (such as national-level statistics for comparison purposes).

- **Carefully manage the network of providers.** The actuarial exercise has shown that the number of private providers has grown to represent 55 per cent of accredited health facilities. More analysis is needed to ensure that the growth of the network indeed translates into a wider geographical availability of services, which should be the guiding principle when engaging with private providers. A careful monitoring of available technical platforms and services of private providers, as well as of the capacity of said services, must be maintained to keep pace with the growing demand from NHIMA beneficiaries. **In the future, a mapping of the network's providers should be performed to (i) confirm the national availability of NHIMA benefits; and (ii) identify possible duplications or inefficiencies as well as priorities for the extension of the network of accredited providers in a strategic fashion.**

- **Rationalize the accreditation and pre-authorization processes.** The SOCIEUX+ governance review of the NHIS has noted a duplication in accreditation procedures between NHIMA and the Health Professions Council of Zambia (HPCZ). In a number of countries, national health insurance relies on licensing and accreditation by the Ministry of Health to ensure the technical fitness of providers and have a complementary mechanism for administrative empanelment with the scheme. Careful scrutiny of the accreditation and licensing steps is recommended, in order to identify potential redundancies. The drastic increase of pre-authorizations for the use of certain services, specifically for those which do not constitute an emergency, is a factor in inefficiency and the rise in administrative costs.

- **Review providers' payment practices.** The general design of provider payment methods (PPMs) are the following:
    - Level 1 hospitals receive a flat rate (capitation) payment with differentiated tariffs for inpatient and outpatient services.

- At Level 2 and 3 hospitals, the flat rate payment is also used for outpatient services, but payment for inpatient services includes diagnosis-related groupings (DRGs) and fee-for-service for high-cost interventions such as dialysis and some cardiac interventions.

It is important for NHIMA to apply the appropriate provider payment methods for the respective services and service providers, as this can impact the financial viability of the scheme. While fee-for-service can be adopted to incentivize the use of certain services, which should be based on a strong public health rationale, it should not be the primary *default* method of payment. International examples show that the recurrent use of fee-for-service is a factor in cost escalation, as noted through the actuarial analysis exercise. **The ILO therefore recommends a review of provider payment mechanisms and a move towards a better mix of case-based and capitation payments rather than only fee-for-service.**

- **Build capacity of NHIMA's team on monitoring systems for the NHIS, the extension of coverage as well as actuarial capacities.** After this project's efforts to build actuarial capacities of NHIMA, continued follow-up engagements are needed, especially on aspects beyond actuarial work that were pointed to be missing as part of this exercise (monitoring structure, detailed planning and capacity for extension). The NHIMA Research and Planning Department's capacity to carry out the actuarial analysis should be strengthened. Peer operational departments should complement this capacity with better data inventories and performance management reporting. While NHIMA's management team is already experienced and knowledgeable on social health insurance, it would be useful to build capacities on NHIS monitoring, including on the sourcing and use of the data generated by the scheme, as well as national statistics, as key indicators for decision-making. In addition, and in order to ensure a high rate of take-up for all groups, NHIMA's capacities on extending coverage to those who are still not covered should be strengthened, including to especially vulnerable groups such as the SCT beneficiaries. To that end, it is recommended to develop a NHIMA capacity-building plan to be progressed following the present actuarial analysis exercise.

- **Strengthen operational synergies with other social security agencies.** Zambia has three social security agencies, responsible for health, pensions, and work injury. Despite differing mandates, similar operational challenges are faced by these agencies, including securing effective ICT frameworks and extension of coverage to the informal economy. Harnessing operational synergies between the social security agencies can improve data and risk management, as well as scheme sustainability and extension of coverage.

7.2.4. Broader social health protection in Zambia

A broader issue to be considered in the Zambian landscape is the prospective inclusion of sickness and maternity cash benefits in the NHIS offering. **Sickness and maternity cash benefits are an important part of social health protection, as they help to secure income in case of illness or pregnancy** and therefore support nutrition and resting time, which in turn directly impact health and indirectly impact the use of healthcare services and their associated costs.[36] In Zambia, whilst these facilities are available to public- and private-sector employees, they rely on an employer liability mechanism. Employer-liability schemes do not comply with the core principles of international social security standards as enshrined in ILO Convention No.102, including the principles of collective financing and participatory management of social security (Articles 71 and 72). Moreover, the duration of sickness and maternity benefits in Zambia are respectively only 26 days for non-vulnerable groups, and 12 weeks for all. This is not in line with Convention no. 102, where

[36] ILO, *Maternity Income Protection in Southern and Eastern Africa: From Concept to Practice*, 2019. https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---soc_sec/documents/publication/wcms_733996.pdf.

sickness benefit duration should be at least 26 weeks (or 52 weeks according to the ILO Medical Care and Sickness Benefits Convention, 1969 (No. 130)), nor in line with the ILO Maternity Protection Convention, 2000 (No. 183) where maternity benefit duration should be 14 weeks. National social assistance programmes[37] similarly provide some income security but remain relatively unspecific when it comes to covering the extra cost of sickness and maternity. Finally, a large share of workers is covered by neither employer liability nor social assistance. The efforts to reach universal coverage for healthcare could also be an opportunity to consider possible solutions to provide income security for sickness and maternity through a collectively financed mechanism, taking into account a combination of contributions and taxes.

7.2.5. Improve NHIS synergies with social assistance programmes

The Social Cash Transfer (SCT) programme is the main means-tested social assistance programme in Zambia, targeting households with older persons, members with severe disability, members who are chronically ill and on palliative care, child-headed households and female-headed households with at least three children. These households are eligible if they are not able to meet basic needs, as estimated by a Household Living Conditions Index. Registration is done by MCDSS District Officers or their delegates at specific times and dates. There are limitations to the outreach capacity of MCDSS, which might cause under-registration of eligible households.

This study has made a dedicated effort to determine the costs of on-boarding SCT households to the NHIS. There is need for NHIMA to coordinate efforts with MCDSS in respect of communication and awareness raising, as well as registration and on-boarding of SCT households. The interphase between the NHIS and SCT databases should be improved to refine the profiling of the covered population and the monitoring of their health needs. It is expected that the socio-economic profile of SCT households will have a bearing on their health service utilization rates, and as such the actual trends should be carefully monitored. With the successful on-boarding of the SCT households, coverage can additionally be extended to the beneficiaries of the other social assistance programmes to ensure that no one is left behind.

[37] Existing social assistance programmes include the Public Welfare Assistance Scheme (PWAS) which provides educational, healthcare and social support and repatriation of stranded persons to six categories of vulnerable population groups; the Food Security Pack (FSP), a programme for poor and vulnerable but viable farmers who have lost their productive assets due to climatic conditions or structural adjustments; the Livelihood Empowerment and Support Scheme (LESS), providing financial and technical support to vulnerable women in order to enhance the sustainability of their businesses, household income and food security; the Child Grant programme, a social cash transfer programme for poor households with children under five years old, and the Social Cash Transfer (SCT) programme.

Appendix 1. Summary of the legal provisions of the National Health Insurance Act

This appendix provides a general overview of the key coverage, contribution and benefit provisions of the National Health Insurance Act No. 2 of 2018 (the Act)[38] and its supporting legislation, The National Health Insurance (General) Regulations (SI 63).[39]

A1.1. Context

- The Act establishes the National Health Insurance Scheme (NHIS) via Section 12. The scheme has the objective of providing "*universal access to quality insured healthcare services*".
- Section 4 of the Act establishes the National Health Insurance Management Authority (NHIMA), as a "*body corporate*", responsible for the operation and management of the scheme.
- Section 41 of the Act establishes the National Health Insurance Fund (NHIF) into which NHIS *contributions* and "*such other monies as may vest or accrue*" to the scheme will be deposited, and from which the "*cost of insured healthcare services*" and "*administrative expenses*" will be paid.
- NHIMA is required by Section 5(s) of the Act "*to cause the undertaking actuarial valuations of the Scheme at prescribed intervals*".

A1.2. Coverage

The following groups of workers are eligible for coverage under the Act:

- Section 13(5) indicates that "*a self-employed citizen and established resident shall register as a member of the Scheme*".
- "*...a member and a family member shall access the benefits package under the Scheme as prescribed*" (Section 20).
- Section 21(1) indicates that "*membership to the Scheme shall cease on the death of a member*". In this regard, Section 21(2) stipulates that "*a family member is entitled to continued benefits for a period of four months following the death of the member*". Section 21(3) states that "*The mechanisms for the continuation of benefits of a family member after the period referred to in subsection (2) shall be as prescribed*."

The Act provides the following relevant definitions in this regard:

- It defines "member" as "*a member of the Scheme as provided under section 13*" (Section 2).
- It defines "family member" as "'*a registered child, spouse and dependant of a member*" (Section 2).

38 https://www.parliament.gov.zm/sites/default/files/documents/acts/The%20National%20Health%20Insurance%20Actl%2C%20No.2%20of%202018%20Sig.pdf.

39 https://www.nhima.co.zm/publications/si.

- It defines "child" as per the Constitution of Zambia (Section 2), which in turn defines the term as "*a person who has attained, or is below, the age of eighteen years"* (Section 266).
- It defines "dependant" as "*a person, who resides with a member, and relies on the member's income for survival*"(Section 2).
- It stipulates that "*a citizen or established resident who is above eighteen years shall be registered as a member of the Scheme"* (Section 13(1)).
- It indicates that "*an employer shall register an employee with the Authority",* as a member (Section 13(3)).
- It defines "citizen" as per the Constitution of Zambia (Amendment) Act, 2016,[40] which in turn defines the term as a "*citizen of Zambia*".
- It defines "established resident" as per the Immigration and Deportation Act, 2010,[41] which in turn defines the term as "*a person who is not a citizen or a prohibited immigrant and who has been ordinarily and lawfully resident in Zambia…*"
- It defines (in Section 2) "employer" and "employee" as per the Zambia Employment Act Cap 265,[42] which in turn defines "employer" as "*any person, or any firm, corporation or company, public authority or body of persons who or which has entered into a contract of service to employ any person, and includes any agent, representative, foreman or manager, who is placed in authority over such person employed*" (Section 3).
- "Employee" is defined as *"any person who has entered into or works under a contract of service, whether the contract is express or implied, is oral or in writing, and whether the remuneration is calculated by time or by work done, or is in cash or kind, but does not include a person employed under a contract of apprenticeship made in accordance with the Apprenticeship Act or a casual employee".*
- "Casual employee" is defined as "*any employee the terms of whose employment provide for his payment at the end of each day and who is engaged for a period of not more than six months*".

A1.3. Financing

A.1.3.1. Contributions

1. Section 15(1) of the Act indicates that "*an employer shall pay to the Scheme an employee's contribution consisting of the employer's contribution and the employee's contribution at a prescribed percentage"*.

   Section 15(3) of the Act indicates that "*a manager of a pension scheme shall pay to the Scheme a retiree's contribution, as prescribed"*.

40 https://www.parliament.gov.zm/sites/default/files/documents/amendment_act/Constitution%20of%20Zambia%20%20(Amendment),%202016-Act%20No.%202_0.pdf.

41 https://www.parliament.gov.zm/sites/default/files/documents/acts/Immigration%20and%20Deportation%20Act.pdf.

42 https://www.parliament.gov.zm/sites/default/files/documents/acts/Employment%20Act.pdf.

Section 15(4) of the Act indicates that "*a self-employed citizen or established resident shall pay a contribution to the scheme, as prescribed*".

Section 15(5) of the Act stipulates that "*the Minister shall, in consultation with the Authority, prescribe rates of contribution for different benefit packages and payment mechanisms available to the member*".

2. The prescribed contribution rates are outlined through SI 63, Section 9 as well as Schedule III. The monthly contribution rate is premised on a prescribed percentage of "*basic salary*"[43] with respect to formal sector employees, whilst the self-employed rate is premised on "'*declared income*".

3. Section 15(5) of the Act allows "*for the Minister… in consultation with the Authority, (to) prescribe rates of contribution for different benefit packages and payment mechanisms available to the member*".

4. Section 22(1) of the Act states that "*the benefits of a member may be suspended where a contribution in respect of that member is not paid to the Scheme*", while Section 22(3) clarifies that "*the period of suspension shall be for a month during which the amount remains unpaid or such longer period*". Table A1.1 summarizes the contributory obligations to the NHIS, as per Schedule III.

Table A1.1. Contribution rates for the NHIS

Category	Payment mechanism	Rate	Frequency
Employee	Payroll based	1% of basic salary	Monthly
Employer	Payroll based	1% of basic salary	Monthly
Self-employed	Direct payment	1% of declared income	Monthly

Sources: NHI Act and SI 63.

5. Section 16 of the Act "*exempts a citizen or established resident*" from contributing to the scheme, if such person is:
   - *"a mentally or physically disabled person who is unable to work*;
   - *"an elderly person above the age of 65*;
   - *"a person classified as poor and vulnerable by the Ministry responsible for social welfare*, *and*
   - *"any other person as may be prescribed by the Minister"*.

A.1.3.2. Financial management

6. Section 41(5) of the Act indicates that "*the Authority shall not, in any year, expend on activities or programmes…related to paying administrative and management expenses; and programmes for the promotion of access to insured health care services… more than a prescribed percentage of the monies held by the Fund in that year"*; while Section 19 of SI 63 stipulates that "*the Authority shall not, in any year, expend more than ten percent of the monies held by the Fund in that year on activities or programmes… related to paying administrative and management expenses; and programmes for the promotion of access to insured health care services".*

7. Section 42 of the Act authorizes "*the Authority (to) invest any monies of the Fund that are not immediately required for the purposes of the Fund in the manner authorised by the Board"*.

   - According to Section 41(1): "*There is established the National Health Insurance Fund for the purpose of the Scheme. (2) Despite the generality of subsection (1), the Fund shall be held and applied for the purposes of— […] (b) paying administrative and management expenses; and (c) programmes for the promotion of access to insured health care services that the Minister may, in consultation with the Authority, determine*."

[43] The Act makes reference to "salary". This report has adopted the use 'earnings' which is more encompassing.

A.1.3.3. Fees and charges for medical services

8. Section 17 of the Act requires "*the Authority…for each year (to) establish and update a uniform national standard schedule of the fees and charges for items and services provided by accredited health care providers*".

9. Under Section 18 of the Act:

   "(1) The Authority shall negotiate with accredited health care providers, a schedule of fees and charges for insured health care services that are fair and optimal.

   "(2) In negotiating a schedule of fees and charges, under subsection (1), the Authority shall take into consideration the—

   "(a) need for a uniform national standard of fees and charges;
   "(b) objective of ensuring that accredited health care providers are compensated at a rate which reflects their health practitioner's expertise and the value of their service, regardless of geographic region and past fees and charges;
   "(c) need to establish a prescription drug formulary system, including medical interventions, which encourages best practices in prescribing and discourages the use of ineffective, dangerous, or excessively costly medications where better alternatives are available; and
   "(d) need to use generic medications where such are available while allowing the use of brand-names and off-formulary medications as prescribed in the Benefit Package."

10. The Second Schedule of SI 63 lists prescribed fee units and accreditation of healthcare providers:

Category	Fee units
Hospital	40 000
Hospice	40 000
Clinic	20 000
Laboratory, Diagnostic centre and Pharmacy	20 000
Ambulance service	20 000

A1.4. Contingencies covered: Medical care

Section (2) of the Act defines "benefits package" as the "*benefits a member is entitled to under the Scheme*"'. This is explicitly defined in the Fourth Schedule of SI 63 as follows:

Benefit Package

The National Health Insurance Benefit Package includes the following:
1. Medical Care
   1.1. Consultations, examinations
   1.2. Diagnostic services (Radiology and laboratory)
   1.3. Nursing Care
   1.4. Hospitalisation
   1.5. Intensive Care Unit

2. Surgery:
    2.1. General Surgery
    2.2. Anaesthetics
    2.3. Orthopaedics
    2.4. Paediatric Surgery
    2.5. Ear, Nose and Throat

3. Maternity and Neonatal Care:
    3.1. Antenatal Care
    3.2. Delivery (Normal or Assisted)
    3.3. Caesarean Section
    3.4. Postnatal Care

4. Eye Care Services:
    4.1. Selected services

5. Oral Health Services:
    5.1 Selected services

6. Pharmaceutical Drugs and Supplies:
    6.1. Prescription generic drugs on the essential drugs list prescribed by an accredited heath care provider an approved or use under the Scheme.
    6.2. Medical supplies
    6.3. Blood products

7. Physiotherapy:
    7.1. Selected services

8. Fertility treatment according to set criteria.

The National Health Insurance Benefit Package shall not include:

1. Treatment Abroad

2. Cosmetic surgery and aesthetic treatments (except reconstructive surgery which it is medically required)

3. Weight loss procedures and treatment

4. Long-term inpatient nursing care (over 90 days)

5. Medical treatment of motor vehicle accident injuries covered by other insurance/funds arrangements, such as motor vehicle insurance and a Motor Vehicle Accident Fund.

6. Treatment of occupational accidents and illness covered by Worker's Compensation Fund.

7. Treatment of injuries resulting from declared national disasters in collaboration with the National Disaster Management and Mitigation Unit.

Appendix 2. Data requested for the ILO/HEALTH Actuarial Model

A2.1. NHIS financial statements

The NHIMA Annual Audited Accounts Reports and/or interim financial statements for the years 2020, 2021 and 2022 (as at 30th September 2022) were requested and submitted. The detail expected from these reports is outlined below. Where there were data deficits observed, these were remedied through bilateral follow-up engagements with the NHIMA Management.

Revenue	Expenditure
• Contributions from mandatorily enrolled members (separated between employers and employees). • Contributions from voluntarily enrolled members. • Transfers/subsidies from government (breakdown of transfers for specific groups, if applicable). • Revenue from financial investments. • Transfers from other national organizations and international governments, entities or individuals. • other income (if any).	Expenditure on health services by healthcare package: • Promotional services. • Preventive services. • Curative services. • Diagnostic and rehabilitative services. • Ambulance service and other services as prescribed. • If the Health Insurance Board (HIB) uses a different classification of the interventions included in the Benefit Package, please provide the information using that alternate classification. • Administrative expenditure by governance level (Federal, Province and Local) and by main function (enrolment, collection of contributions, claims processing, others). • Other expenditure categories (if any).

A2.2. General data

The general data requirements include demographic, economic and labour force data, as well as health infrastructure and human resources data to inform capacity assessments of the Zambia health system.

A.2.2.1. General demographic data

Data	Description
National population data	Population by age and sex. Historical series for the last 20 years and official projections for the next 20 years
Historical information on total fertility rates (20 years).	Total fertility rates and fertility rates by age
Historical information on migration rates (20 years)	Net migration rates by age and sex
Historical information on mortality rates and life expectancy (20 years)	Mortality rates by age and sex (infant mortality rates, under 5 Life expectancy by sex

A.2.2.2. Labour force and general economic data

Data	Description
Historical and projected information on labour force	Labour force and employed population by status in employment (employees, employers, and own-account workers, by age and sex (last 10 years and projected for the next 20 years)
Labour force participation rates	Labour force participation rates by age and sex (last 10 years and projected for the next 20 years)
Historical information for the self-employed	Self-employed population by age and sex
Historical information on wages or income	Average wage or average Income by sex Wage growth rate (real and nominal) Wage share of GDP
Historical information on inflation rates (10 years)	Inflation rates: (CPI and GDP deflator rates by year)
Historical information on GDP (10 years)	Nominal GDP by year Real GPD by year Real GDP growth rate by year
Historical information on market interest rate (10 years)	Interest rate by year (lending rate or bank rate that usually meets the short- and medium-term financing needs of the private sector)

A.2.2.3. Health infrastructure and human resources data

Data	Description
Health infrastructure	Provide a detailed list of infrastructure available for the health system and specific to the scheme. Include third party providers (if necessary).
	Provide a list of health infrastructure by level of care (primary, secondary, tertiary) and type (public/private) in the country.
Health staff	Provide the total number of healthcare staff by categories of employment.
	Provide the total number of health and non-health staff of the facilities of the system and specific to the scheme.

A2.3. Scheme-specific data

The NHIS scheme-specific data complement the Annual Audited Accounts Reports and/or interim financial statements to provide explicit detail related to income and expenditure, against which projection assumptions are formulated.

A.2.3.1. Covered population: Active contributors and insured population

Data	Description
Coverage rates of the labour force (10 years)	Active contributors as a percentage of the labour force, by population group and by sex
Information on active contributors (10 years)	Number of active contributors, by population group, by age and sex
Information on insured active contributors (10 years)	Number of insured active contributors, by population group and by sex -
Information on family dependants of active contributors (10 years)	Historical number of family dependants, by population group covered, by age and sex

A.2.3.2. NHIS expenditure

Expenditure – Historical	Description
Expenditure on healthcare benefits	Expenditure on health benefits by population group by health package, payment method and sex (10 years)
Administrative expenses	Administrative expenses (10 years)
Expenditure on other cash benefits	Expenditure on other cash benefits by population group and by sex (10 years)

A.2.3.3. NHIS income

Revenue – Historical	Description
Contributory salary/income	Average contributory salary or income, by sex (10 years). If the scheme applies a standard lump sum amount for contributions (i.e. not based on salary or income), please provide the amount.
Total revenue	Total revenue by population group (10 years)
Revenue from social contributions	Contribution revenue from employers (10 years) Contribution revenue from salaried workers (10 years) Contribution revenue from other groups (10 years) such as self-employed, voluntary registered members, etc.
Revenue from investments (10 years)	Nominal rate of return on investments of the reserve fund of the social security scheme by type of financial instrument. Real rate of return on investments of the reserve fund of the social security scheme, by type of instrument. Revenue from investment of the reserve fund by type of financial instrument.
Government transfers/taxes	Revenue from government transfers (10 years)
Balance sheet on contributions	Balance sheet on contributions and expenditure: revenue less expenditure on contributions (10 years)
Balance sheet total	Total balance sheet: total revenue minus total expenditure (10 years)
Reserve fund (if any)	Reserve fund (10 years)

A.2.3.4. NHIS membership

Employers / Members	Contributions	Contributors	Insured / Dependants
Unique employer ID number	Month/Year	Salary/Contribution amount	ID main contributor
ID main contributor	Month/Year	Salary/Contribution amount	ID of insured/dependant (as applicable) Sex Birth date (as applicable) Relationship with main contributor (as applicable) Type of affiliation to the scheme (e.g. subsidized, non-contributory)
ID non-contributory member	Month/Year	Transfer amount from Government (if applicable)	ID of insured/dependant (as applicable) Sex/Birth date (as applicable) Relationship with main contributor (as applicable)

A.2.3.5. NHIS claims

	Claims data							
Descriptions	Claim number	Claim amount	Type of claim/Identifier of intervention	ID of the insured person (beneficiary)	Type of provider/ provider ID as applicable	Date of claim	Date of intervention	Number of days hospitalized

International Labour Organization

Republic of Zambia
Ministry of Labour and Social Security