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IMPACT INSURANCE

SEHAT
SAHULAT PROGRAM

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Report

Actuarial Analysis of the Federal Sehat Sahulat Program

April 2019

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The Sehat Sahulat Program of the government of Pakistan is and continues to play a vital role in Pakistan, providing invaluable cover to millions of poor households. We would like to thank GIZ and Federal Ministry for Economic Cooperation and Development, Germany (BMZ) for funding and supporting this important study. As fellow advocates for social change, it has been an honour to work with GIZ and the SSP.

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ACRONYMS AND ABBREVIATIONS

ALOS	Average length of stay
BISP	Benazir Income Support Programme
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (Federal Ministry for Economic Cooperation and Development, Germany)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ILO	International Labour Organisation
IP	Inpatient
LOS	Length of Stay
NSER	National Socio-Economic Registry
PKR	Pakistani Rupee
RBNP	Reported But Not Paid Amounts
SLIC	State Life Insurance Corporation
SSP	Sehat Sahulat Program
TPA	Third Party Administrator
WHO	World Health Organization

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Pakistan has made great strides in health coverage, offering valuable inpatient (IP) cover to some of the most vulnerable members of society through the Sehat Sahulat Program, both the Federal[1] and Khyber Pakhtunkhwa Province initiative. The Sehat Sahulat Program (referred to in this report as the SSP or the Program) is the first of its kind and is fully subsidized by the government. It has been administered by State Life Insurance Corporation (SLIC) since inception at the end of 2015. The government currently pays a fixed premium per eligible family to SLIC, which in turn manages members' IP healthcare expenditure. Ninety per cent of any unspent net premium is refunded to the government at the end of the three-year contract period with SLIC.

By October 2018, 3.2 million families had been enrolled across 38 districts. Over the next three to five years, the SSP plans to expand coverage to a total of around 11 million families across Pakistan.

In 2018, an independent actuarial study of the Program was commissioned by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH with funding from the Federal Ministry for Economic Cooperation and Development (BMZ); this report captures the key findings and recommendations of this study. The objectives of the study are to:

- provide an objective and independent assessment of the Program, thereby strengthening financial governance and building risk management capacity;
- compare the current premium rate from Phase I (the first three years of the Program) to the actual per family claims experience to date, and project future claims cost and expenses over the next three years;
- provide insight into the historical claims experience of the Program, identifying the key factors driving claim costs;
- build a projection model to provide a useful benchmark for a reasonable range of future premiums, as well as the level of uncertainty around the projections, at the time of appointing a new third party administrator (TPA) at the end of 2018; and
- create an open dialogue about the membership profile and claims experience at a scientific session at the 9th Annual Public Health Conference of the Health Services Academy in Islamabad on 4th December 2018. The conference brings together a wide variety of stakeholders in the health system, including researchers, decision makers and implementers. Results were presented to this audience, providing an opportunity to discuss data patterns observed and whether these could be explained by those who better understood the lives and attitudes of those covered. A further objective was to transfer knowledge about typical features of health insurance programs to those needing an introduction or less familiar with these types of financing arrangements.

This report is intended for a wide audience, with an attempt to use as little actuarial jargon as possible. However, certain concepts and terminology are required to understand the issues and these are defined in the report (see the section on Terminology). It is also intended that this report is partially educational in that it gives insight into actuarial thinking, demystifying what is meant by one type of "actuarial study" in the health context. For full understanding, this report must be read in its entirety.

[1] Previously known as Prime Minister's National Health Program

Providing health cover, such as is done through the SSP, is a balancing act. For financial sustainability, it is important that 1) enough funding is set aside for the Program and the premium level is adequate to cover the claims costs and associated expenses of the Program, and 2) the Program functions as efficiently as possible, offering the maximum care affordable to the maximum number of people, with little or no leakage, i.e. fraudulent claims activity or inefficient processes. The actuarial study provides insight into the first item, while some of the recommendations address the second. It is also important to consider financial sustainability along with other issues, such as quality of care. Uncovering aspects relating to the quality of care provided and the impact thereof on the incidence rates or average cost of care is beyond the scope of this study, however, the quality of care is likely to have an impact on both. Poor quality could lead to increased re-admission rates and the necessity to escalate needed care, possibly leading to higher costs. SLIC are tasked with current hospital empanelment and do have a list of criteria to ensure quality of care as per the Operation Manual of the Program. While this list of criteria is acknowledged, an audit of whether the empanelled hospitals do indeed meet these criteria was likewise beyond the scope of this study.

The actuarial study is broken into two parts:

1. The **experience analysis**, in which we study historical data.

2. The **projection model**, which uses insights gleaned from the experience analysis as well as other assumptions. Modelling includes stress testing of the assumptions.

Key outputs generated from the claims experience analysis include:

1. The **Base Table**, the starting point for the projection model, lists key statistics (incidence, average cost per IP claim and calculated per member and per family cost of claims) by different clinical categories (medical, surgical and maternity). It is important to project the incidence rates and average costs separately, as each has different drivers. The Base Table can be found in *Appendix A – Base table and projections*.

2. A study of how incidence rates, average costs of claims and average lengths of stay vary with age, sex and area (urban/rural). These are the **actuarial factors** referred to in the report.

From the analysis, the followings key results are observed:

1. Admission rates (as measured by incidence rates) are very low when compared with statistics from both developed countries (OECD/EU) and new economies (e.g. Thailand and Mexico). Even in comparison with its own Baseline Survey in Pakistan, the admission rates observed are still very low and hence may be subject to substantial increase in the future. The future pace of change is unpredictable, but will, amongst other factors known and unknown, depend on the way the scheme is promoted and marketed, as well as access and supply side issues.

2. The projected claims costs and expenses (in nominal terms) are most sensitive to the assumed increase in utilization (the incidence rate), assumed increase in the unit cost and fairly sensitive to the family size assumption.

3. Information provided about the SSP's target population and UN census data were used to project the population over a five-year period. The order in which the SSP will expand to new districts is unknown and thus the exact mix of the membership by age, sex and rural/urban location is likewise uncertain. If the UN population mix by age and sex is taken as a proxy, the mix of the SSP's membership by these three factors is assumed to remain relatively stable, although with a marginal increase in the percentage of women covered and marginal

urbanisation. As these projected demographic changes are small, their impact on the resulting average premiums is likewise small. If, in reality, there are big changes in the age, sex or, less significantly, geographic location, there will potentially be a greater impact on the cost of claims and hence required premiums.

4. The baseline indicative premium required (the base scenario from which we flex the assumptions) from the projection model is 1,755 Rupees per family per annum for the three years from 2019 to 2021. The base scenario assumes that the next three years will be similar to the past three years, with relatively low incidence rates. This single projection should ***NOT*** be looked at in isolation as there is uncertainty around the assumptions; it is the range and not a single model point that must be considered. Through testing the sensitivity of the assumptions (stress testing the model), the premium per family varies around the base scenario by -5 per cent to +46 per cent and up to +146 per cent if we assume a utilization increase that is equivalent to utilization rates observed in more mature schemes. Excluding the more extreme scenarios gives a range of 1,674 to 2,569 Rupees per family per annum.

The results and modelling need to be interpreted in the context of the SSP still being a very new scheme with limited historical experience. Although the population enrolled in the Program is sizeable, the incidence rates and therefore the numbers of claims are relatively small for the purposes of statistical modelling. This is fairly typical in new schemes experiencing rapid expansion. Usually, and as per our model, we expect both the frequency of claims per member and the average cost per claim to increase over time. The current family risk premium is therefore unlikely to be sufficient to cover future expected claims and would need to be increased for the period 2019 to 2021. Historical experience appears to suggest a recent fall in average claim per family, but it is unlikely this would continue and is more likely a result of recent rapid expansion.

From an actuarial perspective, the more unified the Program, the greater the pooling of financial resources and risk, the higher the volume of available data and the lower the statistical variability in experience.

Our key recommendation is that the family premium is increased during Phase II[2], using our benchmark premium estimates (the range mentioned above) and the discussion in this paper as a guideline. Given the level of uncertainty associated with the current rapid expansion, we also strongly recommend:

1. Monitoring of incidence rates and other key variables (for example, family size) on a frequent basis (monthly). Monitoring can provide early warning indicators for potential future deficits.

2. A full actuarial and statistical experience analysis and premium adequacy review be repeated on a biennial basis, with interim experience analyses conducted as required.

3. An annual report should be compiled by the insurer on the experience relative to the premium received, including Key Performance Indicators (KPIs), such as loss ratios, rejection ratios and an expense analysis.

4. The TPA holds reserves in the first and some of the second year to ensure that claims can be paid in the later years if a level premium is to be applied for three years. We modelled a scenario where the reserves are invested (rather than just kept in cash), showing that investment return in the reserves could help lower the premium per family required, but with a modest impact. This is because the funds would only be invested for a short term and the scale of the fund is

[2] Starting in January 2019

not significant given that the fund is assumed to be exhausted at the end of the fiscal equilibrium period of three years. There are also risks and costs involved with investing reserves, which are likely to offset any minor benefit over such a short period.

5. From a leakage and cost control perspective, the TPA should ensure that it is clear how and when the benefit limits are applied, and be consistent in doing so. We recommend that the SSP investigates introducing alternative payment mechanisms to the current fee-for-service reimbursement of hospital bills. We also recommend the benchmarking of hospitals and providers to identify high spending and inconsistencies in the type of IP procedures claimed as this is likely to identify potential fraud. Ideas for further studies are given in the recommendations section of the report.

The SSP is viewed by many stakeholders as a key building block as Pakistan moves towards Universal Health Coverage. It is intended that this actuarial report and the thinking herein will help those who manage the Program maintain financial sustainability as it moves forward in its mission to ensure that an increasing number of citizens have access to affordable, quality healthcare.

BACKGROUND AND OBJECTIVES OF THE ACTUARIAL STUDY

BACKGROUND

This actuarial report and the underlying analysis was commissioned by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Sehat Sehulat Program with funding from the Federal Ministry for Economic Cooperation and Development (BMZ) through the Pakistan-German bilateral project "Support to Social Protection incl. Social Health Protection (SP-SHP)". The project aims to improve access to needs-based social protection services for people living in poverty and at risk of falling into poverty.

The actuarial analysis is of the Federal Sehat Sahulat Program (referred to as the SSP or the Program)[3]. One of the key motivations for the actuarial study was that of independence. It was agreed that an independent review of the Program would meet the objective of strengthening financial governance and building risk management capacity – important not only to the related national institutions but also to their social partners. The International Labour Organization's (ILO's) Impact Insurance Facility was therefore approached as a partner to conduct the actuarial analysis given that the team could vouch for independence and provide the necessary niche health actuarial expertise. Housed at the ILO, the Impact Insurance Facility enables the insurance industry, governments, and their partners to realise the potential of insurance and other similar financial risk-pooling programs to support social and economic development.

The Program is for those living below or just above the poverty line. It is subsidized by the government and has been administered by State Life Insurance Corporation (SLIC) since inception at the end of 2015.

The third party administrator (TPA) is appointed through an open tender process. Competing insurance companies submit details of their technical capabilities, along with financial bids calculated from their estimate of future claims costs plus associated administrative expenses to manage the policies. The winner is selected based on their administrative capabilities and on the premium they require from the government to pay the estimated claims plus administrative expenses. Providing independent actuarial technical expertise was therefore seen as a valuable exercise, to give appropriate analytics for data-driven decision making. To date there have been two tenders, one in 2015 and one towards the end of 2018. SLIC was appointed on both occasions.

More on Pakistani-German Technical Cooperation

Pakistani-German Technical Cooperation in the area of health and social protection spans over more than 15 years to strengthen Pakistan's health system in the area of Service Delivery (Safe Blood Transfusion, Tuberculosis Control, Reproductive Health, and Quality Management), Public Health Education and Research, and Health Sector Reforms, including health financing and developing health insurance models. Since 2016 it supports the federal government and the governments of the Khyber Pakhtunkhwa and Punjab provinces in implementing the new health programs and developing models for improved service delivery of existing programs for basic social protection (one-window operations) at district level and promotes inter-provincial exchange and learning at national level.

ACTUARIAL STUDY OBJECTIVES

The main purpose of the study was to conduct an actuarial analysis of the SSP, namely to compare the current premium rate to the actual per-family claims experience to date and future expected (projected) claim cost and expenses over the next three years, showing a range of potential outcomes.

[3] Known as the Prime Minister's National Health Program until January 2019

Furthermore, given that the appointment of the TPA is partially based on the premiums they quote, the study would also provide a useful benchmark (a reasonable range of future premiums) at the time of appointing a new TPA at the end of 2018 and important insight into the claims experience of the newly established health insurance scheme. Part of the purpose of the study was to identify the key factors driving the expected future claim costs and hence the future required premium, and determine the level of uncertainty around the projections.

Health cover, such as that provided through the SSP, is relatively new in Pakistan. Many of the key stakeholders are therefore unfamiliar with health insurance mechanisms. A final objective of the study was to create an open dialogue about the membership profile and claims experience at a scientific session of the Health Services Academy's 9th Annual Public Health Conference in Islamabad on 4th December 2018. We were to discuss the results and whether some of the data patterns could be explained by those who better understood the lives and attitudes of those covered. A further objective was also to transfer knowledge about typical features of health insurance schemes.

This is the first actuarial analysis of the SSP.

INTENDED AUDIENCE OF THIS REPORT

This report has been prepared for the SSP, however, as a public good, it is also a publicly available document. It should be read in its entirety and with a warning that it should not be relied upon by other parties or organizations with different scheme structures. Programs with different benefits, different members and in different regions – or with any other difference – will likewise experience varying morbidity patterns and will require a different premium or contribution per head or per family. It is recommended that professional actuarial expertise be sought if a similar analysis is to be repeated elsewhere.

The report is written with a non-actuarial audience in mind, using as little actuarial jargon as possible. In order to aid understanding, we have defined important terms in the terminology section and also explained some key actuarial concepts up front.

DATES OF STUDY

The period of study i.e. the dates between which we studied the membership and their corresponding claims data is from December 2015 to October 2018, i.e. we studied all members enrolled in the months from 1st December 2015 to 31st October 2018 and their associated claims incurred during that time period.

MORE ABOUT THE PROGRAM

The Program is set up as a partner-agent model whereby the government currently provides a premium per family to SLIC on behalf of members/eligible citizens to fund their inpatient (IP) expenditure. 90 per cent of any unspent net premium is returned back to the government at the end of the contract period with SLIC (currently three years).

As at October 2018, 3.2 million families in 38 districts had been enrolled into the Program, with a total actively insured population of 17.8 million individuals[4]. The target for expansion in cover is around 11 million families across Pakistan.

To be eligible, a family must be below or just above the poverty line. A poverty census program has been made available through the population National Socio-Economic Registry (NSER) of the Benazir Income Support Programme (BISP). This is used to identify and enrol eligible citizens, each of whom

[4] Members for which the "enrollment date" was active rather than pending.

are given a unique identifier number. Both are very large databases, which help to identify the low-income families. A Nationwide Poverty Scorecard Survey enables BISP to identify eligible households through the application of a Proxy Means Test (PMT) that determines welfare status of the household on a scale between 0 and 100. Families with a PMT of less than or equal to 35 are identified as beneficiary families eligible for the SSP.

The SSP is an IP-only scheme, and is cashless to the insured beneficiaries. There are no exclusions and all pre-existing conditions are covered. The main benefits for Phase 1 are:

- Indemnity coverage for secondary IP hospital care up to 50,000 Rupees per annum per family
- Indemnity coverage for priority hospital care up to 250,000 Rupees per family per annum[5]. Priority care, as defined in the rules, is for the following conditions only:
    - Cardiovascular diseases
    - Diabetes Mellitus complications
    - Burns and road traffic accidents
    - End stage renal disease and dialysis
    - Chronic diseases
    - Organ Failure Management
    - Oncology
- Maternity care up to 17,000 Rupees per annum per family
- Transportation benefit for non-local beneficiaries of 350 Rupees per discharge, also available to women who are discharged from local district hospitals after receiving maternity services

[5] In certain circumstances and for certain conditions, the limits can be raised. Application and monitoring of the limits is managed through the TPA on a case by case basis and with the financial status of the SSP in mind. The coverage for raising the limits is referred to as the "excess of loss coverage", and the second tranche as the "over excess of loss coverage".

WHAT IS ACTUARIAL MODELLING?

We explain below some key actuarial concepts. What makes a study "actuarial" is the ability to not only look backwards at the past, assessing what has happened, but also to use this information together with economic and other assumptions about the future to build a projection model and answer the question: "given what has happened in the past, what is a *reasonable range* of possible outcomes in the future?" The actuarial study aims to highlight potential financial risks to different stakeholders through the modelling exercise by understanding which assumptions are critical and therefore need to be managed carefully so as to manage future financial risk. While this may not initially sound patient-centric, the sustainability of any healthcare financing mechanism – insurance based or otherwise – relies on the premise that enough money has been budgeted and set aside upfront to at least try to meet the promises made in the future. Thus measuring and actively managing financial requirements and risks by anticipating what could happen is amongst one of the most patient-centric activities managers of a health program can perform.

For health insurance, key assumptions for the future are the morbidity trends, namely the incidence rates and average costs per claim. The demographic characteristics of the future covered population have a significant impact on future claims incident rates and costs, but other factors, such as the propensity to claim, the burden of disease and the availability of, and access to, care are also important.

It is important to understand that claims experience has inherent volatility and therefore a minimum volume of historical observations (i.e. past data) is needed for setting reasonable assumptions for the future. If there is insufficient historical data required for statistical credibility, there is a risk that the historical data is distorted by a small number of unrepresentative claims. For the purpose of this analysis, we believe there is a reasonable volume of data to start to form meaningful conclusions, but we note that often at the start of similar health insurance schemes, there is a period of low claims while members are getting familiar with the claims process – we refer to this as the "durational effect". It is preferable therefore to have several years of claims data to understand the relationship between the different factors that affect the propensity to claim. The more historical data there is to analyse, the more reliable and stable the statistics and the more certainty in the projections, although it is also important to understand the processes that gave rise to the historical data and how those processes may differ in future.

Another key actuarial principle is the principle of correspondence. When analysing past scheme data, it is necessary to ensure that the *incurred* claims data and membership data fall exactly within the same time period i.e. that they correspond. It is important to consider incurred rather than paid claims, otherwise, as a result of the time-lag between claims being incurred (the date of treatment) and paid, the resulting average claim amounts and incidence rates will be distorted, especially if the program is expanding or contracting rapidly.

Definitions and explanations for various actuarial terms used in this report can be found in the Terminology section at the end of the report.

The results from the actuarial analysis are presented in two steps: first the experience analysis (see Box 1 for more information), which looks at the past data. The second step is the projection, and involves projecting the experience forward (see Box 2). Figure 1 gives a simplified illustration of how the actuarial claims experience analysis and projection modelling relate.

BOX 1. What is an actuarial “experience analysis”?

An actuarial experience analysis describes a standard statistical study to understand the historical claims experience at a granular level. It involves looking at past data to answer questions such as:

- How many members/families enrolled and what was their collective “Exposure” (period during which they were collectively covered by the Program)?
- Who enrolled and what are their demographic characteristics? What can we say about the membership mix by sex, age and whether they are urban/rural?
- What was the average claim per family per annum and the average claim per person?
- Was the family premium set in 2015 sufficient to fund the average family claims?
- Were there differences in the number of claims per person (utilization or incidence rates) or the average size of claims depending on whether members are young/old, male/female and urban/rural?
- Where were patients mostly treated? At public or private hospitals? What was the cost per claim difference between the two settings?
- What was their average length of stay (ALOS), and does this vary by age, sex and urban/rural?
- Do two people of the same age and sex have different claims experience because of the time they have been enrolled in the scheme (the "duration" effect)?
- Is there a statistical way to isolate the different factors that contribute to the probability of claiming and the average claims cost and estimate the effect of each?
- What has the historical ratio of claims to expenses been?

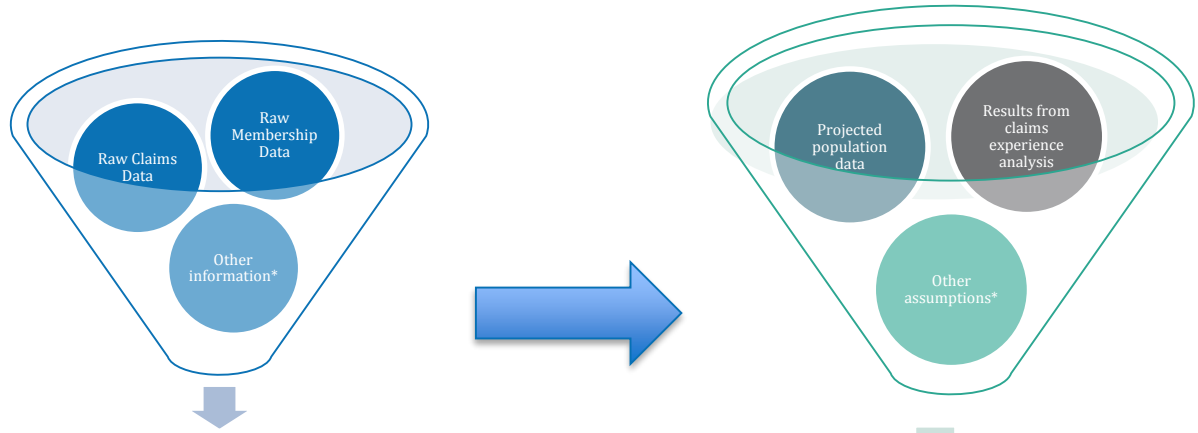
Answering these questions is important because understanding the past helps us set assumptions for the future.

BOX 2. What is projected in an actuarial projection for a health program?

Looking to the future, we want to answer:

- Who is likely to be covered in the future, in terms of age, sex and area mix?
- What assumptions do we need to project future claims costs and related insurance administration expenses, and hence calculate the required family premium?
- Which assumptions drive the calculation of the family premiums most significantly and what is the level of uncertainty around these assumptions?
- We expect premiums per person to increase each year due to increasing propensity to claim and inflation in claims costs. What happens when we average the increasing average family premium over a three-year projection period i.e. what “level premium” do we get?
- If we “stress test” the assumptions, what is the resulting range of level premiums?
- By how much should the current family premium be increased over the next three years to cover the expected claims and expenses?

Figure 1: Simplified process for actuarial claims experience analysis and projection modelling



Claims Experience Analysis:
incidence rates and average costs observed in the past

**e.g. Operational information*

Projections, scenario and stress testing

**e.g. Macroeconomic projections*

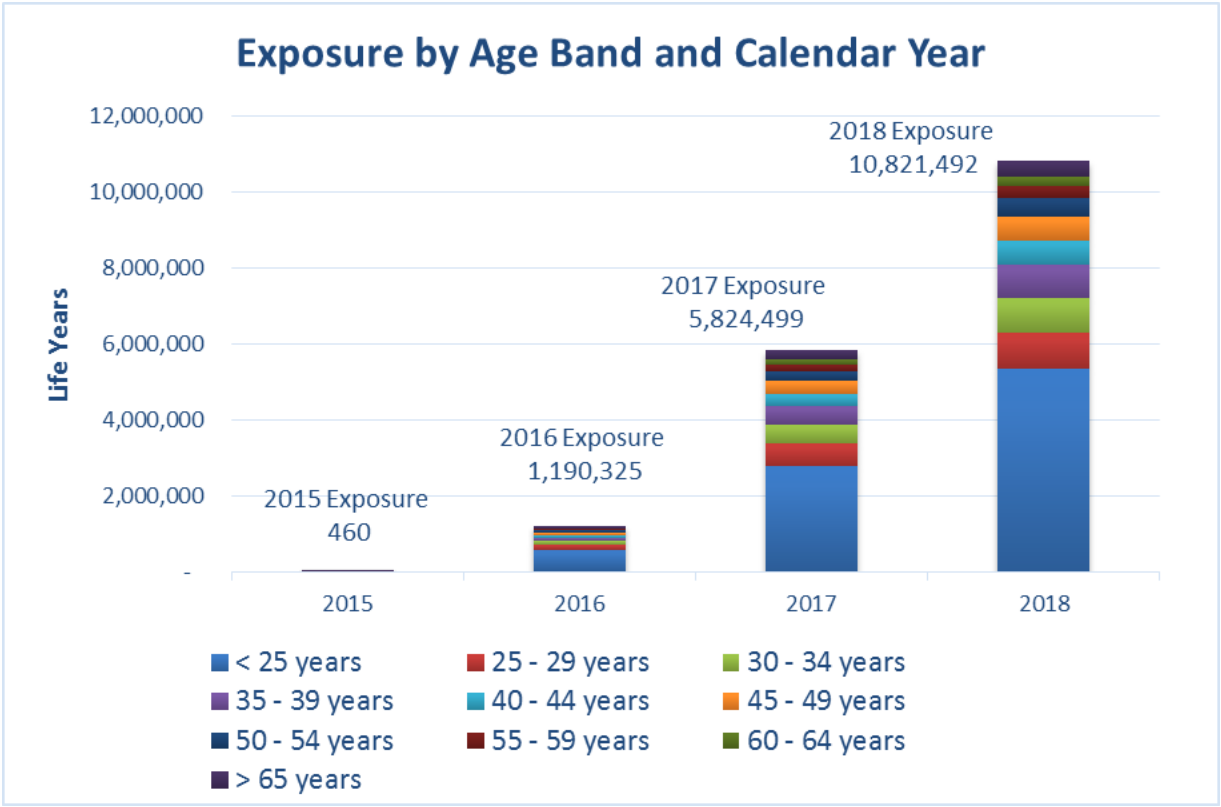
STEP ONE: EXPERIENCE ANALYSIS – LOOKING AT THE PAST

The first step in any actuarial analysis is to understand the historical data. The SSP started at the end of 2015. So, the first part of our analysis involved reviewing the enrolment and claims data from the first date of inception of the Program (December 2015) until October 2018. In effect, we looked at all the membership/enrolment records for the period (the "exposure" analysis) and all the associated claims which happened in that period (the claims "incurred" analysis).

EXPOSURE ANALYSIS

Exposure refers to the total length of time (in years) that Program members[6] have collectively been insured. To understand the term "exposure" consider the following example: a member who enrols half way through the year contributes 0.5 years to exposure by the year end. By calculating the per member exposure within each year precisely by the number of days enrolment and summing this together, we observe the following.

Figure 2: Exposure by Age Band and Calendar Year



Exposure provides a more reliable and insightful measure of membership than a count of the number of enrolled members on a particular date in a year because the latter is just a snapshot in time. For example, if we know that the membership count was 1 million on 31st December of a particular year, this statistic does not tell us whether they were all in the scheme for 1 year or 1 day. Exposure tells us how many life years of enrolment members collectively contributed to each calendar year. This is also needed for calculating incidence and other rates.

We note from Figure 2, that the Program has expanded substantially and in 2018, more than 10 million

[6] Note that "member" refers to all family members and not just the head of the household.

life years were “exposed to risk”. The membership is very young, with more than half the members aged under 25.

Figure 3: Exposure by Sex and Calendar Year

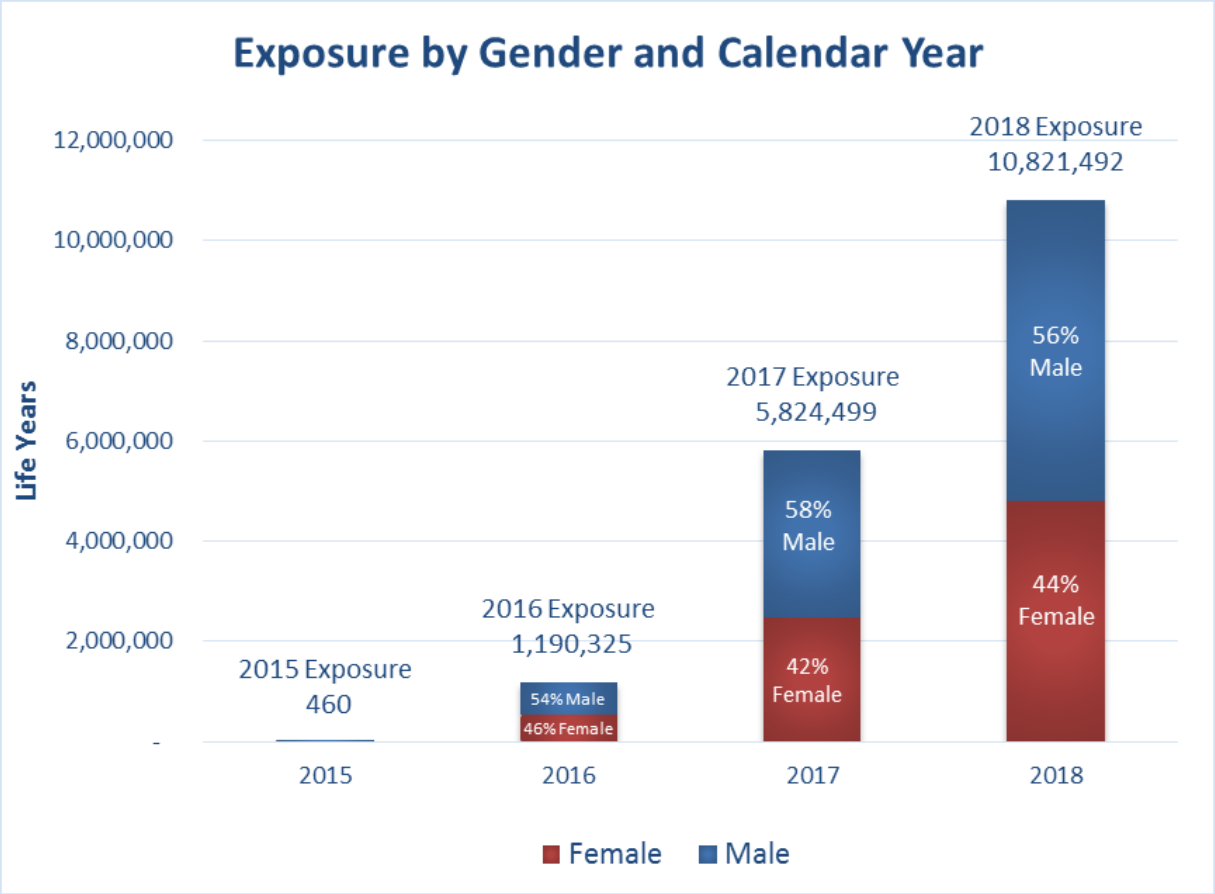


Figure 3 shows that there have been consistently more males covered than females – in aggregate (i.e. over all years), the Program has only 44 per cent female exposure.

CLAIMS EXPERIENCE ANALYSIS

The claims analysis begins with a compilation of a Base Table of claims statistics drawn from the historical data. This provides us with annualised figures for incidence rates, average length of stays, average costs and claims costs per member for different types of healthcare benefits. For reasons which are explained below, the two more stable years of data were used and combined to compile the Base Table (2016 and 2017). The Base Table, which can be found in Appendix A is the starting point for our projection modelling. The statistics represent those for the “average” member in the underlying data for 2016 and 2017.

The incidence rates observed in the historical data are summarised in Table 1:

Table 1: Observed incidence rates by member and family card per 1,000 per annum[7]

Year	Incidence rate per 1,000 members	Incidence rate per 1,000 family
2016	9.3	47.3
2017	6.5	32.6

When we carry out actuarial analysis, we often calculate rates relative to an average rate. For example, we answer the question "what is the relative incidence rate of a 60 year old, compared with the overall population or compared with the average member?". As part of the claims experience analysis, we consider the relativities of average costs, incidence rates and length of stay by the main factors: age, sex and geographic location.

Figure 4, Figure 5 and Figure 6 show the relative rates by age and sex, all relative to the expected incidence rate / average cost per IP claim / average length of stay of males under age 25, which is set to 1.

Figure 4: Age and Sex-wise Actuarial Factors for Incidence Rates

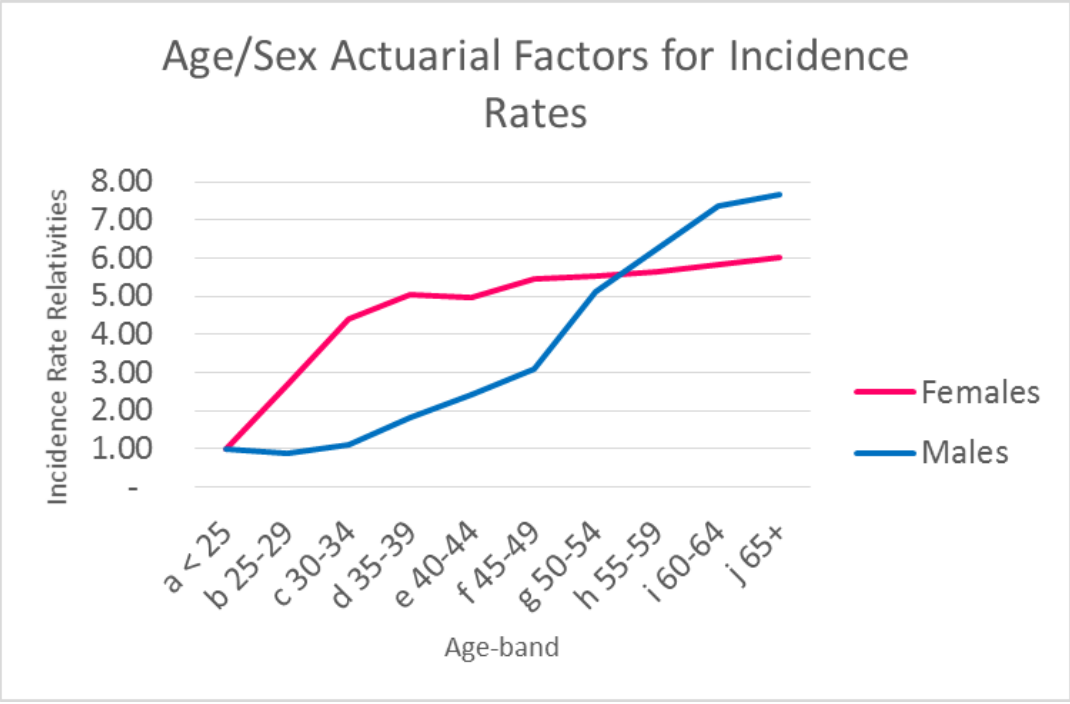


Figure 4 shows that for both men and women, utilization is significantly higher for older age groups. The difference between men and women at the younger ages is partially explained by maternity cases.

[7] The incidence rates in Table 1 are based on paid claims that are greater than zero.

Figure 5: Age and Sex-wise Actuarial Factors for the Average Cost per IP Claim

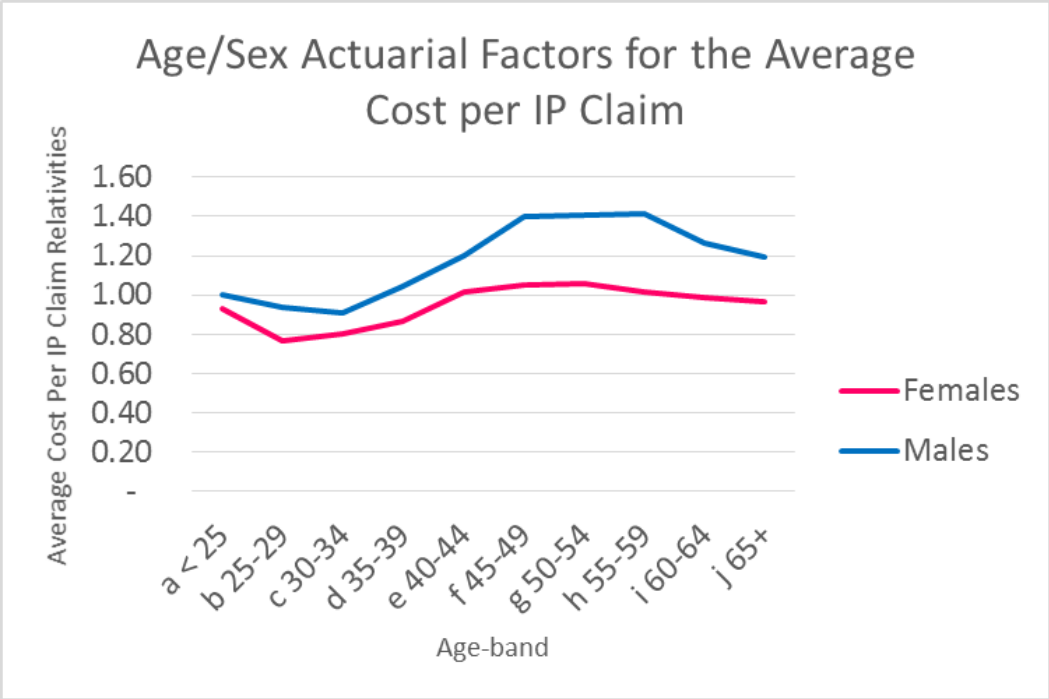


Figure 5 shows that for both men and women, the average cost per claim is slightly higher for the youngest age-group and then higher again at the older ages (50 to 64). For older men (and to a lesser degree women), the relative average cost falls slightly compared with the middle age-groups, but this is likely due to the mix of likely procedures at these ages (i.e. as people get older, it may not be possible to conduct certain complex medical procedures because their age puts them at a higher risk. This could mean that the average cost declines).

On average, it appears that men have higher average costs than women, unless there is some other factor that is correlated more closely with men than women, which can explain the apparent differences. It is sometimes misleading to draw firm conclusions from these “one or two factor at a time” analyses, because strong correlations between factors can distort the results. There could be a number of different factors which explain/predict differences in average costs; in this study we consider age, sex and geographic location (see Figure 7). With health insurance, these are usually the most significant factors by which claims statistics vary, but there could be a number of other contributing factors which could distort the results.

Figure 6: Age Sex-wise Factors for the Average Length of Stay

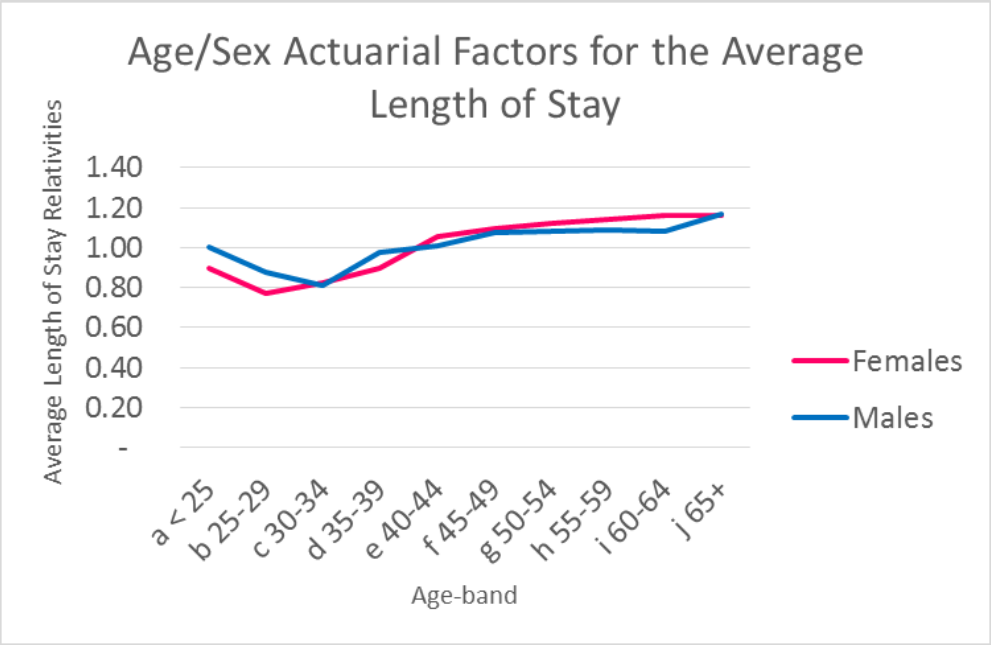
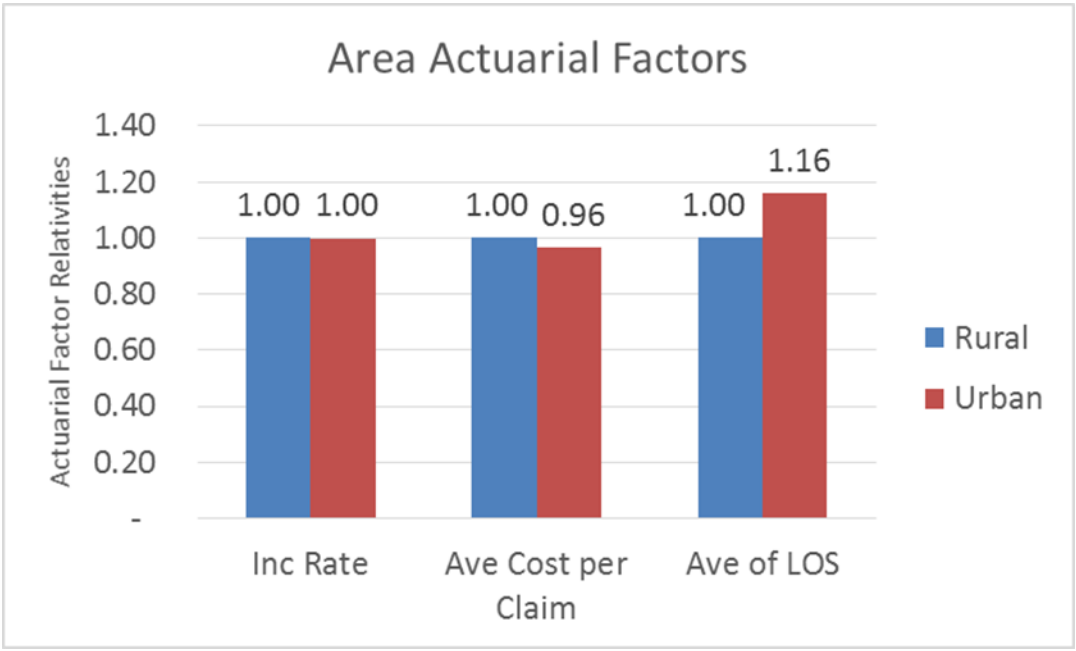


Figure 6 shows there is little difference in the length of time that men and women spend in hospital for IP procedures, but that the very young and old spend longer in hospital on average than young adults.

Figure 7: Area Factors



For populations living in rural versus urban areas, there is no significant difference in the utilization rates observed. The average costs for those from rural areas are, however, slightly higher. The average length of stay is longer for those living in urban areas. The mix of public/private hospitals in rural/urban settings may also impact these results. Note that in Figure 7 the factors are relative to the rural factors, which are set to 1.

RISK PREMIUM VERSUS CLAIMS COSTS

The next part of the analysis compares the current family premium paid to SLIC with the actual claims cost per family in 2016 and 2017, which are the two most recent complete years of experience.

To calculate the claims cost per family, it is first necessary to define what constitutes a family unit. Each family has a unique family SSP health card number, and a member who is designated as head of the family. Using this information and the active member exposure, the average family size ranged from 5 to 6.1 members per family over the calendar years we reviewed. However, this excludes pending members who either appear in the data as "pending" or may be missing altogether. The reason given for pending members is that the demographic data for eligible families was outdated when initially given to SLIC. Therefore, when it came to enrolment, many families had additional members and children who were not registered on the NSER and were missing their national identity numbers. These family members are marked "pending" until they have completed their registration. In the data, 29 per cent of all member records were "pending". Given that pending members are not entitled to claim, they were excluded from the analysis; including them would result in an understatement of claims cost per family (as they would not contribute to the numerator, but increase the denominator). However, it is assumed that the issues around enrolment may be resolved in the coming years and therefore it is prudent to consider that the true family size is closer to 6 rather than 5.

We conducted an additional analysis on SSP's target population for Phase II (as defined by the SSP) using data from the *Block Wise Provisional Summary Results of 6th Population & Housing Census-2017 (As on January 03, 2018)*[8]. The census data contains the population totals and number of households in the SSP's target districts. It was possible to use the census data to calculate the average household sizes for both the rural and urban populations in target districts. Bearing in mind that each household could potentially house more than one family unit, the ranges for average household sizes observed are depicted in Table 2.

Table 2: Range of average household sizes for the SSP target districts

	Rural	Urban
Minimum average household size	5.07	4.90
Maximum average household size	9.70	9.98

Given what we observed in the membership data, the census data and stakeholder conversations, it was agreed that an assumption of around 6.27 members per family unit for the SSP would not be unreasonable.

We analysed the historical claims cost per family in two ways – first by looking at the average of claims per family per annum for active members only, and secondly on an individual member basis (i.e. a per active member per annum basis), making an assumption about the true family size to account for pending family members, and grossing up the per member claims cost to give the adjusted family per annum claims cost. The second method gives a slightly more prudent picture (with regards to the family size assumption) of the annual per family risk premium from the past data, and also provides us with the starting point for the projection modelling, allowing family size to be one of the variable assumptions.

Table 3 compares the family premium as at October 2018 and the resulting risk premium (which is the family premium less administrative expenses[9]) to the claims cost per family in 2016, 2017 and 2016

[8] http://www.pbscensus.gov.pk/content/block-wise-provisional-summary-results-6th-population-housing-census-2017-january-03-2018

[9] Administrative expenses are determined by the SSP as 16 per cent of premium

and 2017 combined. This shows that the current risk premium received by SLIC to pay claims (1,092 Rupees per family) is slightly higher than the combined average of 2016 and 2017 claims costs (1,044 Rupees per family), implying that the risk premium received has been adequate to pay claims for those two years in aggregate.

Table 3: Adjusted Risk Premium versus Claims Costs

	Amounts in PKR
Family premium (as at October 2018)	1,300
Family risk premium (as at October 2018)	1,092
Claims cost per family in 2016	1,234
Claims cost per family in 2017	1,005
Claims cost per family (2016 and 2017 data combined)	1,044

It is not clear why the incidence rates (see Table 1) and claims cost per family fell in 2017 compared with 2016, but one possible theory is that it was due to the rapid expansion of the Program. Typically claims experience is depressed when a scheme such as this begins, because it takes a while before members understand the benefits and how to make claims. Therefore, the addition of many new members in 2017 may have reduced the incidence rate, as all the new members more than offset any increases in claim numbers in 2017 from the existing members who joined in 2015 and 2016.

Typically we expect both the frequency of claims per member and the average cost per claim to increase over time, even if the average age/sex mix remains constant. Therefore, the current family risk premium is likely to be insufficient to cover future expected claims and would need to be increased for the period 2019 to 2021. If the Program continues to expand at the same or a greater rate, it is possible that the average claim per family could continue to fall for a while, but eventually the membership base will stabilize and claims per family will start to rise. In addition, if the average age increases, or if there is a change in the mix of urban/rural membership, the average claim per family may also increase significantly.

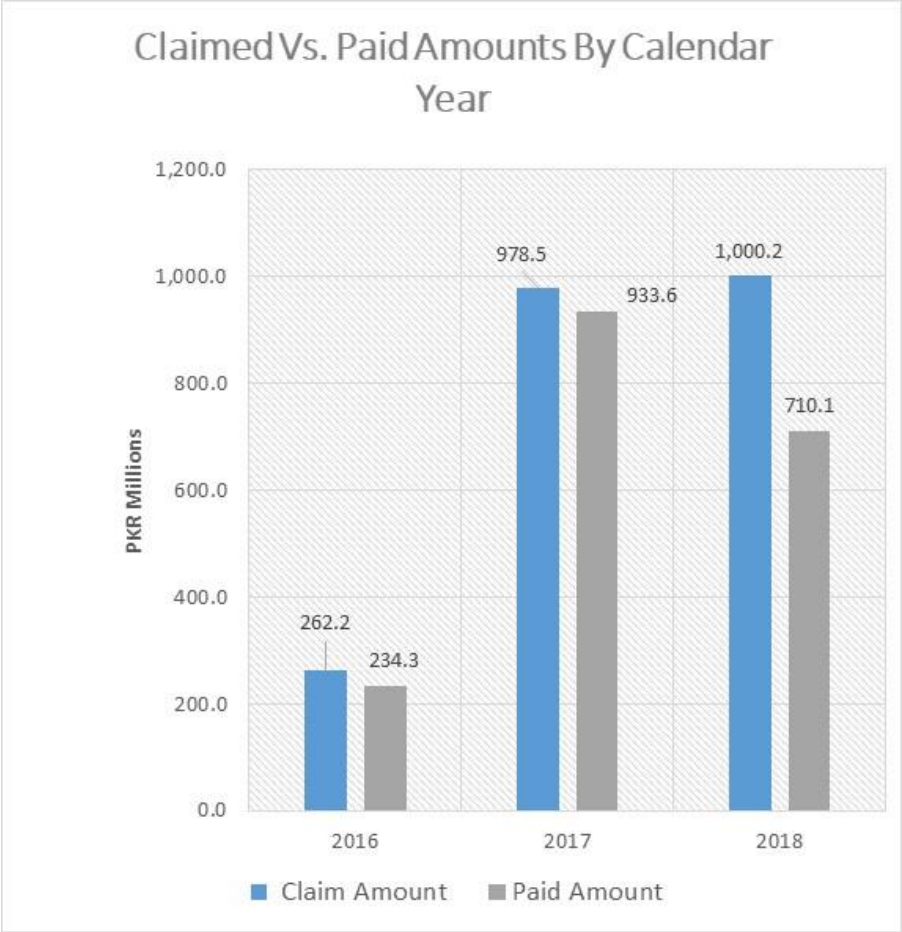
CLAIMED VERSUS PAID

In the claims data, there are two key amounts: amounts “claimed” and amounts “paid”. The difference between the two can be explained by:

a) **Rejected Claims:** Some ineligible claims are rejected and therefore not paid. For example, they might be outside the benefit limits, or come from people who are not actively enrolled.

b) **Reported But Not Paid Amounts (RBNP)**: Amounts paid tend to be lower than amounts claimed because there is a lag between when a claim is incurred and notified to SLIC and when payment is approved and made. We call this difference the “reported, but not paid” (RBNP) amount and if the claims processing time is constant this RBNP amount tends to get larger as a proportion of paid as a Program expands because the claims paid will always lag behind the incurred claims. If the claims notification and processing is highly automated and efficient, the RBNP amount can be minimal, but in Figure 8 there is a large and growing gap between the two amounts, indicating a relatively long notification and payment cycle. This gap is why 2018 data is less reliable than 2017, because in order to use 2018 data, we would need an accurate estimate of RBNP. While it is possible to use actuarial techniques to estimate the RBNP amount, and that would give us a first indication of experience in 2018, it introduces considerable additional uncertainty into the analysis of historical claims experience.

Figure 8: Claimed versus Paid Amounts by Calendar Year



CASES FOR RAISING THE BENEFIT LIMITS

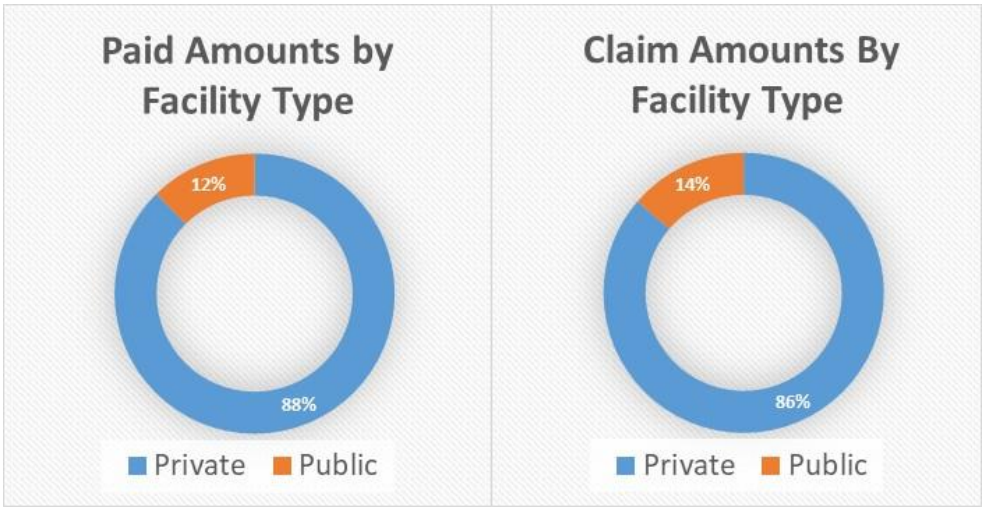
Some claims fall outside the benefit limits, but are nevertheless paid. We observe from the data that around 5.4 per cent of the number of claims paid are outside the benefit limits. The reasons given for this is that there are three specific cases in which the benefit limits are raised: a) life threatening conditions, b) maternity cases and c) during complications.

PUBLIC VERSUS PRIVATE HOSPITALS

Figure 9 shows the amounts paid and claimed by public versus private hospitals. The vast majority of

claims are incurred in private hospitals, but the difference by paid and claim amounts may indicate that public hospitals take longer to get reimbursed by SLIC or have a higher proportion of claims rejected.

Figure 9: Usage by Facility Type



LENGTH OF STAY

Figure 10 shows the ALOS in hospital is decreasing over time. This could partially be explained by more of the IP procedures taking place in a private hospital in 2017 and 2018 compared to 2016, where the ALOS is shorter. In 2016, 86 per cent of procedures took place in private hospitals. This percentage rose to 93 per cent in 2017 and was 92 per cent in 2018. Figure 11 provides some evidence for this possible explanation, showing that public hospitals have significantly longer ALOS than private hospitals. This may be attributed to the mix of clinical conditions for which members are treated in public hospitals, which may have centres of excellence for particular types of complex care. Or this could be a consequence of how public versus private hospitals manage and record their length of stays. A further possibility is that more severe hospitalised patients are transferred to public hospitals partway through their treatment or are admitted to public hospitals from the beginning.

Figure 10: Average Length of Stay by Calendar Year

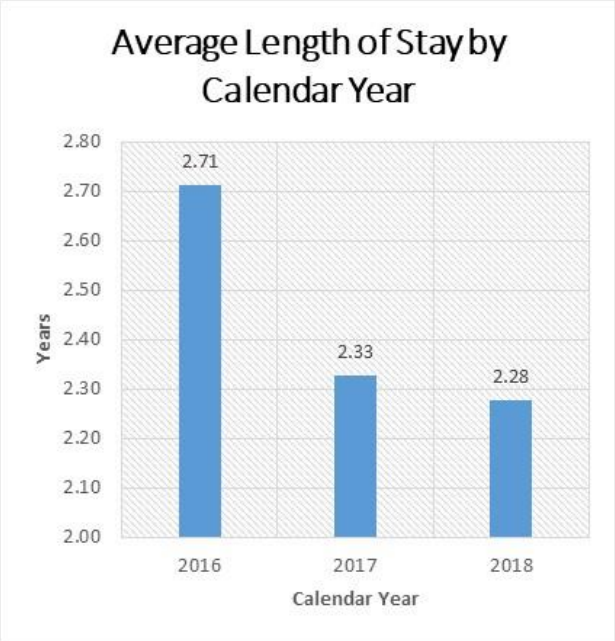
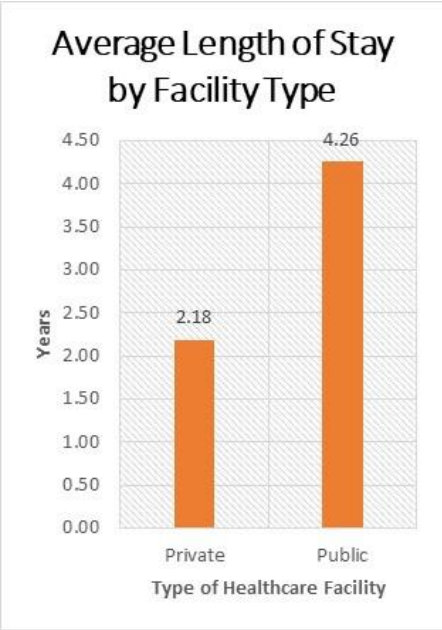


Figure 11: Average Length of Stay by Facility Type



STEP TWO: ACTUARIAL MODELLING – LOOKING TO THE FUTURE

Once we have analysed the historical experience, we can derive suitable assumptions to project future experience. Note that all results and modelling need to be interpreted in the context of the SSP still being a very new scheme with limited historical experience.

Our key modelling assumptions are set out below.

KEY MODELLING ASSUMPTIONS

- The Base Table of starting costs (see *Appendix A – Base table and projections*)
- Unit cost inflation (driven by inflation in hospital prices, which is a combination of increasing wages and improvements in technology/infrastructure)
- Growth in incidence rates (driven by increasing awareness of benefits, access to care and new medical treatments and technology)
- Actuarial factors for age/sex and area (see Figure 4, Figure 5, Figure 6 and Figure 7)
- Administrative expenses (as given by the SSP[10])
- Expected family size of future membership (derived from analysis of member data, Block Wise Provisional Summary Results of 6th Population & Housing Census-2017 and conversations with key stakeholders)
- Impact of limits on benefits
- The additional claims costs from new proposed benefits (these are derived from cost information provided by medical professionals and linked to incidence statistics in the data where many are an additional day or an additional consultation for an IP episode)
- A contingency loading, based on actuarial judgement
- Target population (as provided by the SSP)
- Per annum population projection (based on UN Population Data and the target of families per district as set by the SSP)

RESULTS SUMMARY – PROJECTION MODEL

We built a projection model that takes the average 2016/7 historical experience as a starting point and applies the assumptions listed above to calculate the future claims costs expected for the period 2019 to 2021. Each element of the base table of starting costs is projected separately, line by line, using assumed increases in claims frequency per person and average cost per claim, and then multiplied together to calculate the net of expenses claims cost per person. We overlaid the assumed future demographic split of the population by age/sex and by urban/rural to estimate the increases or decreases in average claims cost per person due to demographic change. We also estimated the effect of the benefit limits over time and applied the expected family size and therefore the average claims cost per family. Annual premiums for each future year are calculated as the total of the expected cost of claims per family plus the administrative load in that year. Finally, we estimated the level annual premium across the three year period that would be required to match the claims arising in that period.

PROJECTION MODEL: BASE SCENARIO

Figure 12 shows the projected annual family premium for 2019 to 2021, and is supported by the numbers in Table 5. This is NOT the best case or proposed scenario, but the initial projection based on the key assumptions listed in Table 4. It is the starting point from which we flex the model assumptions to deduce a reasonable future premium range. The base scenario assumes that the next three years will be similar to the past three years, with relatively low incidence rates only impacted by the age-sex

[10] Note that we did not analyse the adequacy of the expense load, as we received no data on actual expenses. We have therefore assumed that the historical load was appropriate and have used the future expense loadings as defined by the SSP.

factors, area factors and a technology trend. In the model we have an additional parameter that factors up the incidence rates for the purposes of stress testing the incidence rate assumption.

Table 4: Key assumptions for the base scenario projections

Model Parameter	Base scenario assumption		Level of uncertainty around assumption
Data projected from	1st January 2017		n/a – as per the data
Age/Sex-wise factors	See Figure 4, Figure 5 and Figure 6		Low
Rural/Urban factors	See Figure 7		Low
Percentage female	2018 – 44% 2019 – 45%	2020 – 46% 2021 – 46%	Low
Severity/medical cost inflation trend (based on CPI and wage inflation)	2017 – 5.1% 2018 – 4.9%	2019 – 8.5% 2020 – 7.5%	Low/medium
Technology trend (as per the Getzen Model[11] for healthcare projections) – this is applied to the utilization rate trend	1%		Low/medium, but usually this is in the range of 1% to 2%.
Utilization trend (in addition to the age-sex trend, area factor trend and technology trend)	Set to 0% for the base scenario		High
Expense assumptions	2019 – 16% 2020 – 12%	2021 – 10%	n/a as defined by SSP
Family size	6.27 members		Medium, this needs to be monitored in the future
Target population (individual members)	Ultimate target numbers as defined by the SSP – projected population assumptions for next 3 years: 2019 – 25,368,194 2020 – 34,783,276 2021 – 47,950,732		Medium as demographic mix by year is unknown
Contingency loading	2%		n/a
Increase in limits (50,000 to 60,000 for secondary and 250,000 to 300,000 for priority cover)	2% for incidence rates and 2% for the average cost of care, as a once off loading		Medium/high – there is little data to support this assumption and future experience should be monitored. The contingency loading can help offset some of the uncertainty with this assumption.

[11] Getzen Model of Long-Run Medical Cost Trends - SOA
https://www.soa.org/research-reports/2016/research-hlthcare-trends/

Figure 12: Base scenario: projected future premiums versus premium at October 2018

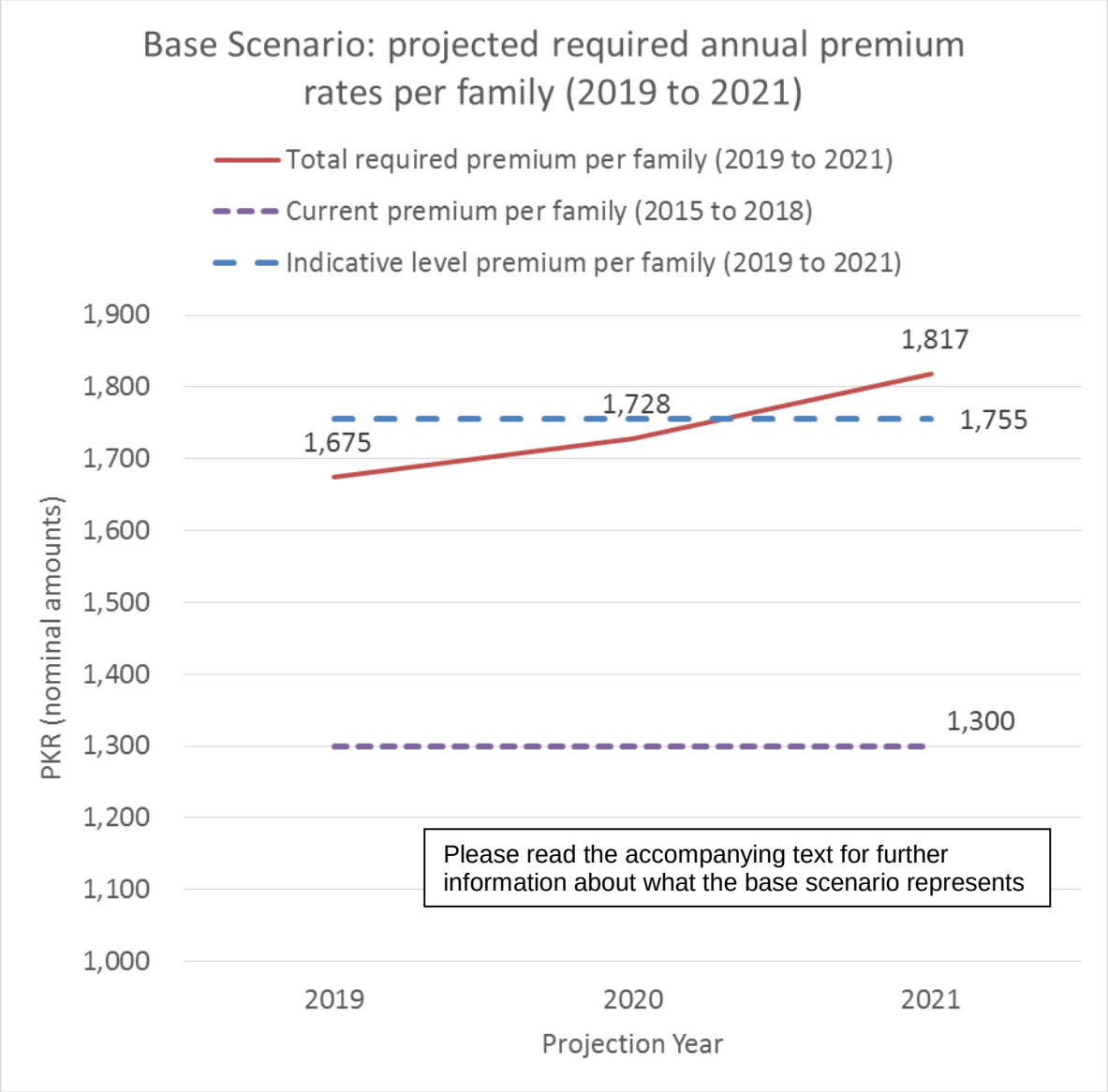


Table 5: High level summary of model projections for the base scenario

	All amounts in PKR		
	2019	**2020**	**2021**
Pure expected risk cost per family	1,384	1,495	1,607
Assumed expenses	264	204	179
Contingency loading (2%)	28	30	32
Total required premium per family	1,675	1,728	1,817
Expected population covered (members, ***not*** families). See population projection section below.	25,368,194	34,783,276	47,950,732
Weighted average level premium (over 3 years) per family	1,755	1,755	1,755

The base scenario assumes that low utilization (low rates of incidence) will continue as currently observed (this is highly uncertain, but just an initial scenario for modelling, which helps us understand

key drivers).

The increase between the historical experience of 2016/7 (see Table 7), which generally matched the risk premium for that period, and the starting point of the projection in 2019 (see Table 9) is 32 per cent and is accounted for by:

a) The additional benefits that are proposed for Phase II of the Program (new benefits, plus an increase in limits on existing benefits). This accounts for 14 per cent of the increase between these two tables. New benefits include additional consultations to existing packages as outlined in the base tables (e.g. additional follow up after surgery). The new secondary IP care limit is 60,000 Rupees (increased from 50,000 Rupees) and the new priority care limit is 300,000 Rupees (increased from 250,000 Rupees). The transportation benefit was also increased from 350 Rupees to 1,000 Rupees.

b) An increase in claims costs between 1st January 2017 and 30th June 2019 (2.5 years). This accounts for 18 per cent of the increase.

Referring back to Figure 12, the increase over time in the red line (which includes the expected risk cost and administrative expenses) is driven by our assumed increases in claims incidence and average costs, as well as a small change in the population demographics and a small increase in the average family size. The Base Scenario assumes that there is no investment return on the accumulated reserves to reduce the premium required. Investing the premium reserves in the short term has a negligible effect the premiums – this was tested in the model.

SENSITIVITY AND STRESS TEST RESULTS

Sensitivity tests are carried out relative to the base scenario to understand the possible range of required premiums. By testing changes in assumptions, we were able to isolate the impact of each assumption on the projected premium in each year and therefore calculate which assumptions affected the annual premium most significantly. The projected claims costs are highly sensitive to the assumed increase in IP utilization (the incidence rate) and the unit cost increase (medical inflation), but family size is also a key assumption because the required family premium is based on an average family size.

The impact of the changes in mix by age, sex and region are less significant; however, this is largely because the projected demographics are not significantly different from the current demographics. Health insurance schemes are typically highly sensitive to demographic mix and therefore, while in the short term the Program's demographics look fairly stable, it would be advisable to monitor this carefully as a small change in mix could have a material impact.

Table 6 shows the results of the various sensitivity tests. The indicative level premium per family varies around the base scenario by -5 per cent to +46 per cent (tests 1-8), and up to +146 per cent for test 10 (high utilization increase). Excluding the more extreme scenarios gives a range of 1,674 to 2,569 Rupees per family per annum.

Table 6: Stress test results[12]

Stress tests on assumptions	Indicative level premium per family (PKR)	Increase/ Decrease to Base Scenario
Base Scenario	**1,755**	
Test One A - Medical cost inflation increases by an additional 3% (i.e. over and above that assumed in base) in each projection year	1,839	5%
Test One B - Medical cost inflation decreases by an 3% (i.e. below that assumed in base) in each projection year	1,674	-5%
Test Two - Overall utilisation increases to 25% higher than the base scenario over 3 years	2,052	17%
Test Three - Overall incidence increases to 50% higher than the base scenario over 3 years	2,392	36%
Test Four - Overall average costs are 10% higher	1,926	10%
Test Five - Overall average costs are 10% higher and incidence rates increase to 25% higher than the base scenario over 3 years	2,251	28%
Test Six - The 25-44 population become 55% female (more women of childbearing age)	1,795	2.2%
Test Seven - Household size increases by 10%	1,960	12%
Test Eight - The 25-44 population become 55% female, family size increases by 10%, incidence rates increase to 25% over 3 years and average costs increase by 10%	2,569	46%
Test Nine - Overall incidence increases to 125% higher than the base scenario over 3 years	3,373	92%
Test Ten - Overall incidence increases to 200% higher than the base scenario over 3 years (i.e. utilisation is 3 times higher)	4,316	146%
Scenarios modelled		
Scenario with investment return (with all other assumptions at the Base Scenario)	1,751	-0.3%

We note that the expense assumptions (all expenses incurred by the TPA other than the cost of IP medical claims) are not stressed as these were taken as given and currently assumed to be a fixed percentage of premium. If the expenses are significantly different to that assumed, there would be a corresponding percentage increase/decrease in the premiums required.

INCIDENCE RATE ASSUMPTIONS

The historical analysis shows fairly low incidence rates per person and we have suggested some possible reasons for this in the prior section. We provide further commentary below, including the potential impact on future incidence rates. We typically see low claims incidence rates when a new medical scheme begins because there is a low level of awareness of benefits and low cultural propensity to seek care for illness. Our experience from other countries shows that similar programs have seen substantial increases in incidence rates over time as the programs mature. As long as new members are joining the Program in large numbers, the new members with lower average incidence per person will keep the overall claims costs low, but as the Program's growth slows down, this could be matched by significant increases in overall incidence rates, particularly if it coincides with an increase in the average age or another positively correlated factor. Utilization in itself, especially where needed, is of course a positive thing, as long as the SSP has made provisions to cover the cost and the utilization is not driven by healthcare providers encouraging unnecessary treatments.

Pakistan currently has one of the world's lowest ratios of doctors, dentists, nurses and paramedics to population[13]. Improvements in supply side and access tend to lead to higher claims incidence rates

[12] For Tests 4, 5 and 8 the average costs in the description refer to the average costs of claims.
[13] Source: National Health Vision, 2016 to 2025

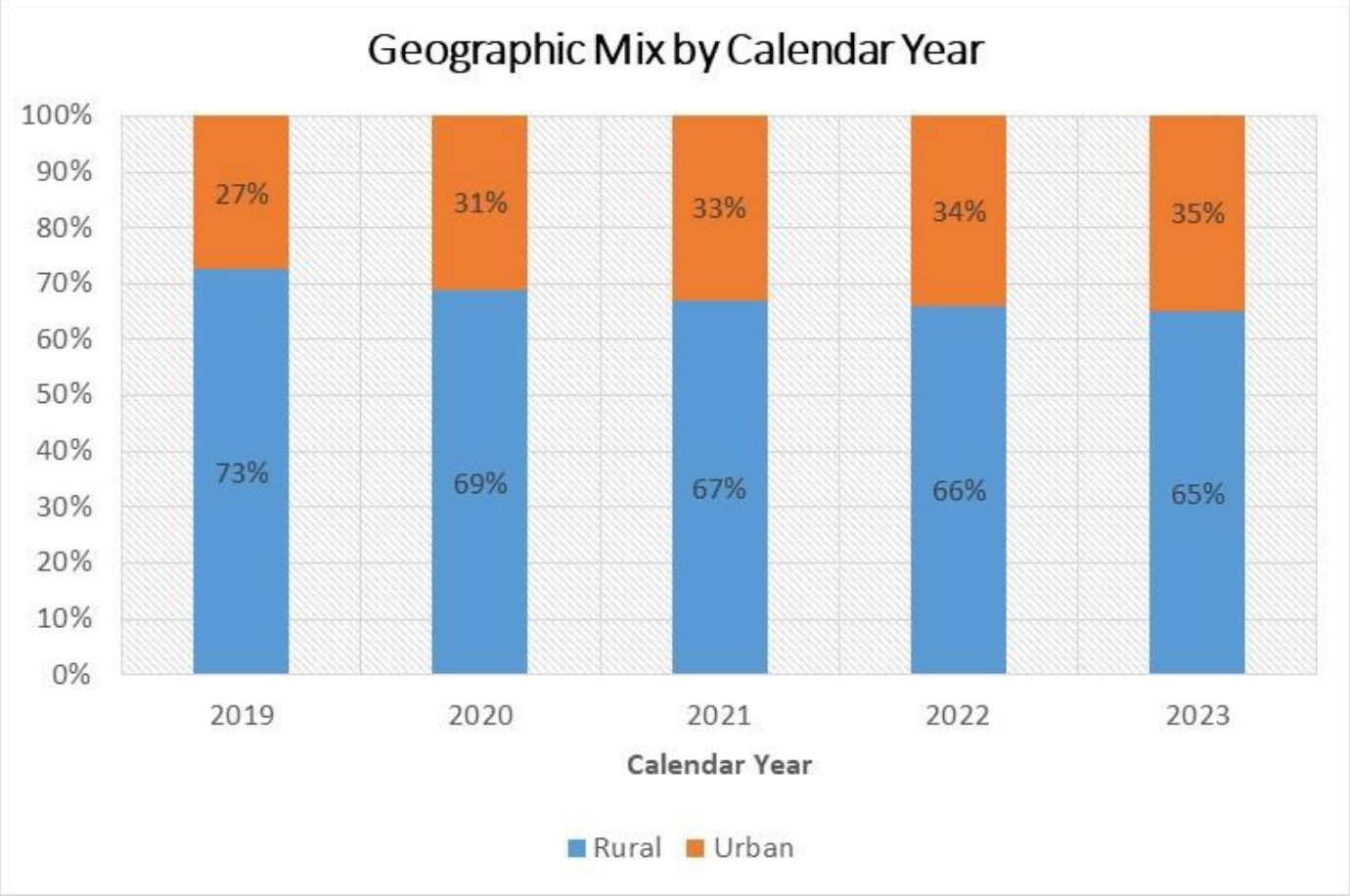
overall and higher total claims costs. Therefore, it is important to monitor claims costs carefully to understand the potential impact of substantial changes in supply side infrastructure. We understand there are plans in place to increase health care delivery infrastructure, but the pace of expansion or impact on claims experience is unknown and so should likewise be monitored closely.

As assumed in the modelling, it is important to note that increasing benefits and benefit limits will increase both claims incidence rates, as well as average costs.

POPULATION PROJECTIONS

Our modelling exercise used the existing target population projections by district as supplied by the SSP, as well as UN population projections for Pakistan, also by district. We used this data to split the historical and projected population by sex and between rural and urban groupings. The assumption is that the change in sex and urban/rural location as per the UN population projections will be mirrored by the SSP's target population. The aim of the SSP is to cover a total of around 11 million families in the next five years. We used linear interpolation to project the numbers from the current membership and over the projection period. Over time, the projections suggest that a higher proportion of the covered population will be in the urban category (see Figure 13).

Figure 13: Population projections show slow urbanisation for members of the SSP

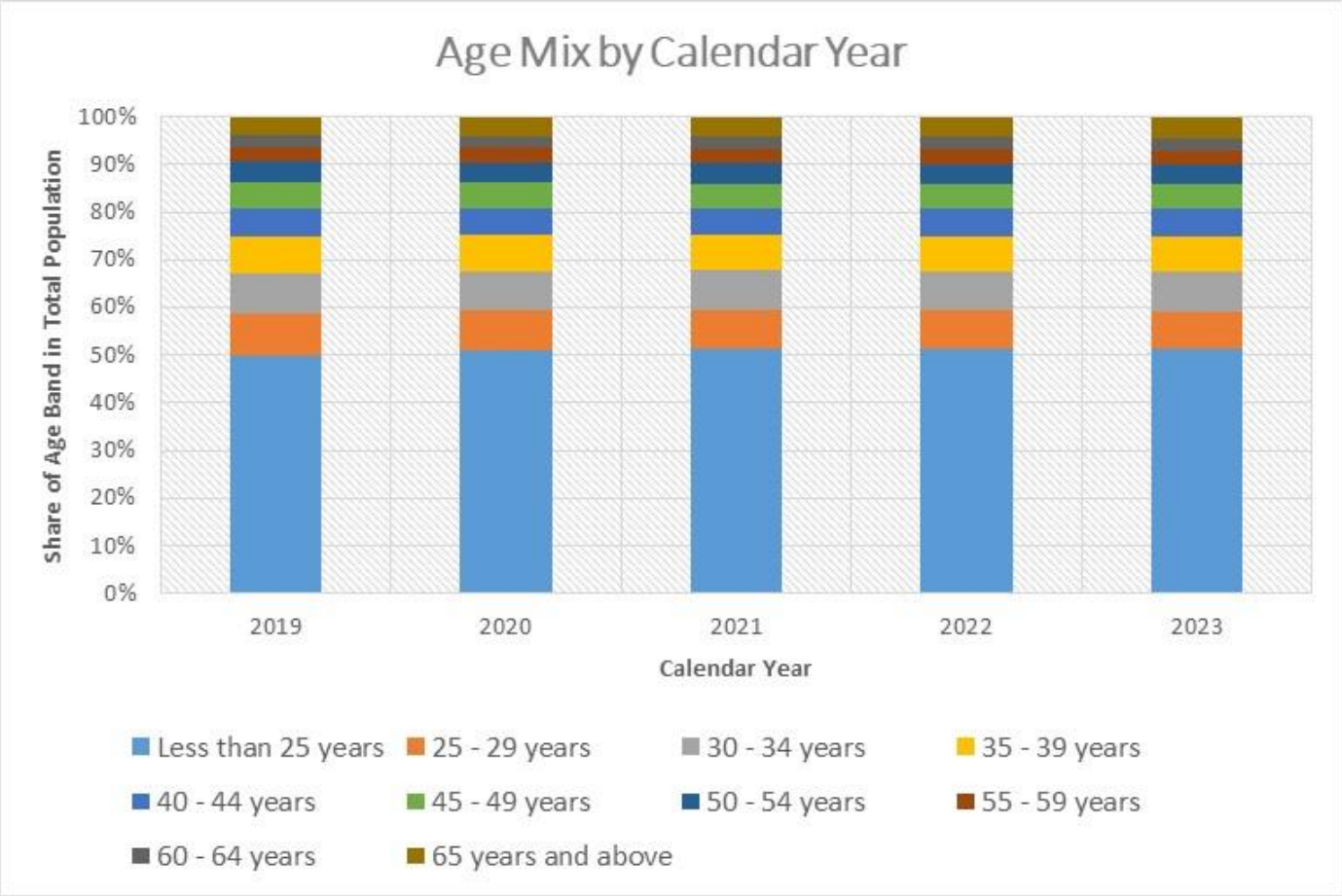


Without knowing the order of expansion (i.e. which districts come first), it is not possible to make exact predictions about how the age and sex mix will shift over time. This is one of the reasons for using the UN population projections. This gives us a sense of how the age structure shifts from the age structure

in the claims experience analysis data towards the wider population mix by age, which is used as a proxy.

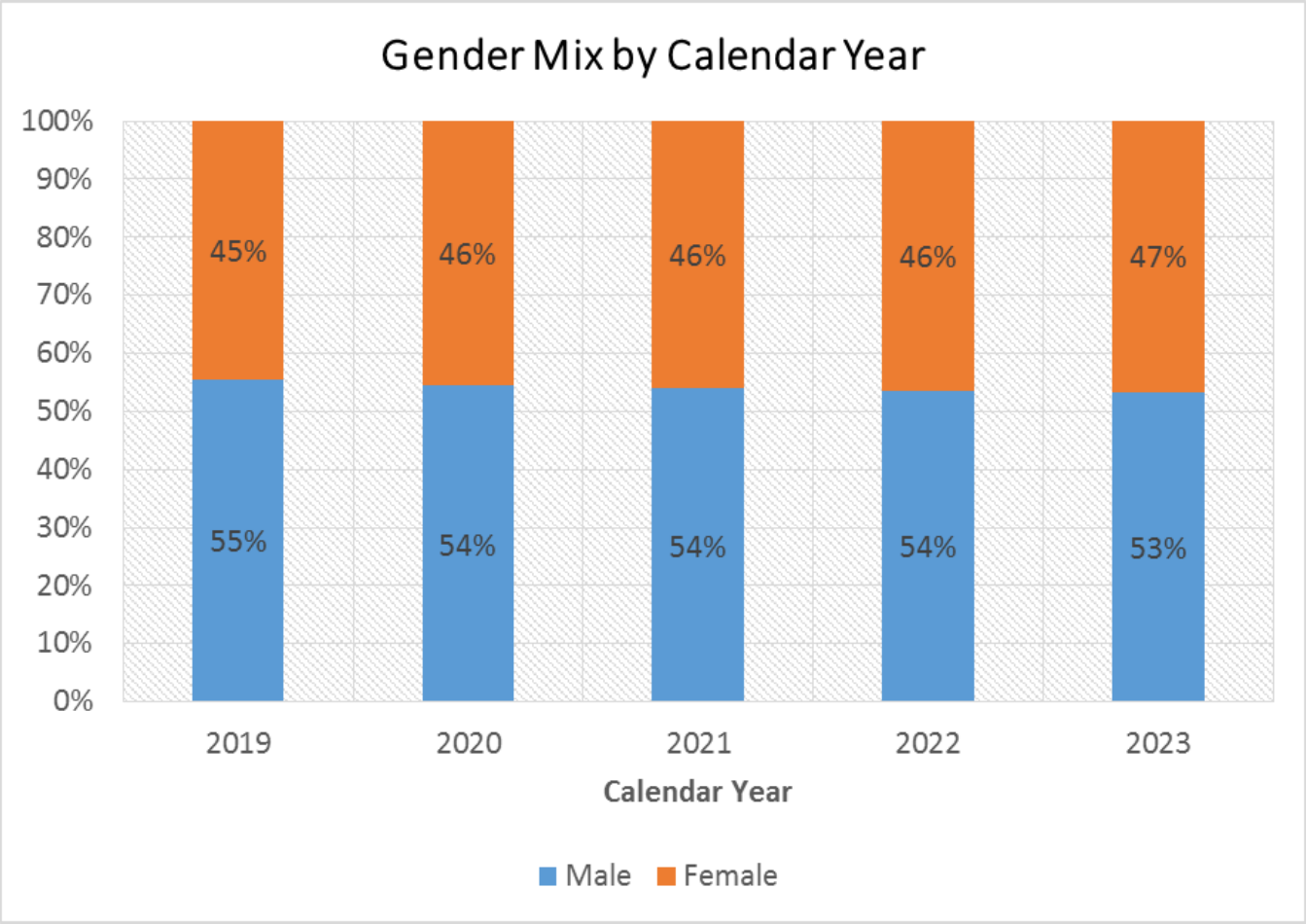
Figure 14 shows that the age structure is assumed to remain relatively stable with a young population over the next three to five years.

Figure 14: Population projections show a stable mix by age for the SSP



Using the same methodology as for projecting the age mix, we observe from Figure 15 that the proportion of females is expected to become slightly higher over time. We understand that the lack of ID cards for women is a potential obstacle to enrolment for women. This is observed in the data, where many of the members with “pending” enrolment are women.

Figure 15: Projected change in the SSPs membership by sex



RECOMMENDATIONS

Based on the analysis, we recommend an increase in the premium provided per family for the Program. We are projecting a substantial increase in costs per family due to claims inflation, changes in demographic mix, additional benefits and changes to the benefit limits.

For financial sustainability, it is important that:

1. Enough funding is put into the Program and the premium level is reasonable to cover the expected claims costs and associated expenses of the Program, and

2. The Program functions as efficiently as possible, offering the maximum care affordable to the maximum number of people, with little or no leakage, i.e. fraudulent claims activity and/or inefficient processes.

There is a substantial amount of uncertainty over the future experience of the Program. We have provided a range of estimates of future claims experience, but the actual claims experience may differ significantly even from this range. Given the level of uncertainty associated with the current rapid expansion, we strongly recommend:

1. Monitoring of incidence rates and other key variables (for example, family size) on a frequent basis (monthly) – monitoring can help by providing early warning indicators for potential future deficits. This is an area where immediate further technical assistance to set benchmarks against which to monitor and setting up a monitoring process would be beneficial.

2. A full actuarial statistical experience analysis and premium adequacy review be repeated on a biennial basis, with interim analyses on an “as required” basis.

3. An annual report be compiled by the TPA on the experience relative to the premium received, including Key Performance Indicators (KPIs), such as loss ratios, rejection ratios and an expense analysis.

From a leakage and cost control perspective, the TPA should:

1. Ensure that it is clear how and when the benefit limits will be applied, and be consistent in the application of the rules.

2. Monitor providers and investigate introducing alternative payment mechanisms to fee-for-service reimbursement of hospital bills.

3. Carry out benchmarking of hospitals and providers to identify high spending and inconsistencies in the type of IP procedures claimed. This could help with potential fraud identification.

FUTURE STUDIES

Additional actuarial studies to consider:

1. A more detailed member cohort analysis by membership duration as the Program expands (e.g. newer versus older members) with a multivariate statistical analysis.

2. It would be beneficial to understand the mechanisms of the current risk share/gain share agreement between the Program and SLIC. Actuarial modelling of the different scenarios to

understand the financial risks each party bears may lead to greater insights into the design and operation of the Program.

MODELLING METHODOLOGY

The methodology for modelling is summarized as follows.

- Collect the raw claims and membership data at a line level from the administrator
- Classify districts into urban/rural and label the data accordingly
- Calculate the number of days exposure in each year for each member in the membership data and summarise the total months exposure by month, year, age group, sex, urban/rural
- Map the claims categories into the clinical categories found in *Appendix A – Base table and projections*. This enables easier modelling, allowing flexibility to change future incidence or average claim amounts at the benefit category level or utilize isolated assumptions to price new benefits related to existing ones (e.g. an additional consultation in the package).
- Investigate differences between claimed amounts and paid amounts and include an allowance for RBNP
- Create a Base Table of claims incidence and average cost by dividing numbers of claims by the corresponding exposure and dividing total claims costs by the number of claims at the claims category level
- Estimate the effect of increasing limits and new benefits
- Calculate average claims cost per member, summarised by age-band, sex, urban/rural, year
- Calculate relativity factors for age-band, sex and urban/rural
- Look at trends in historical incidence rates for patterns
- Project the target population to be covered and the expected changes in demographic characteristics
- Investigate contribution to trend of changes in demographics
- Derive assumptions for projection model from historical data
- Build projection model to project each line of the Base Table forward on a year by year basis, taking into account inflation trends, changes in demographics, changes in benefits and limits
- Calculate future claims costs in each year and associated administrative expenses, based on changes in cost per person and total number of lives from the population projections
- Calculate premium per family, based on average family size
- Estimate the level premium required
- Carry out sensitivity-testing to see what happens when different assumptions are adopted (stress testing) – by changing assumptions and recording the model output

DATA RECEIVED AND SOURCES RESEARCHED

The following is a list of data received and used for the actuarial analysis:

- Membership and Claims Data from SLIC from inception of the SSP to October 2018
- Background documentation from GIZ, the SSP and SLIC, including:
    - Assistance from the SSP and SLIC with mapping membership and claims data to urban/rural
    - Census data: Block Wise Provisional Summary Results of 6th Population & Housing Census-2017 [As on January 03, 2018][14]
    - Presentation for ILO from SLIC, 25th September 2018
    - Operational Manual of the Prime Minister's National Health Program, Ministry of National Health Services, Regulations & Coordination, 28th April 2016
    - Phase I - Instructions for organizations – Expression of Interest document, Ministry of National Health Services, Regulations & Coordination
    - Phase I - PC 1 Form
    - Phase II - Instructions for organizations – Expression of Interest document, Ministry of National Health Services, Regulations & Coordination
    - Phase II - PC 1 Form
    - Phase II - Request for Proposal Ministry of National Health Services, Regulations & Coordination, 7th May 2018
    - Pakistan Demographic and Health Survey 207-18, National Institute of Population Studies, Islamabad, Pakistan and The DHS Program, ICF, Rockville, Maryland, USA, August 2018
    - Package Rates for Islamabad
    - Costing of public sector hospital services: A provider's perspective: GIZ, May 2017
    - Pakistan's Prime Minister National Health Program - Punjab Baseline Survey Report, Faraz Khalid, 17th August 2017
    - PMNHP Implementation and Evaluation Process, Draft July 23, 2018
    - PSLM 2014-15 Pakistan Social and Living Standards Measurement Survey (2014-15), Government of Pakistan, Statistics Division, Pakistan Bureau of Statistics, Islamabad
    - Household Integrated Economic Survey 2015-16

[14] Pulled from: http://www.pbscensus.gov.pk/content/block-wise-provisional-summary-results-6th-population-housing-census-2017-january-03-2018 in October 2018

TERMINOLOGY

AVERAGE COST PER INPATIENT CLAIM

What it is: The average cost of IP claims which fall within a certain benefit category. These are usually calculated for a particular calendar year and separately for all claims categories.

Why they are important: As a base for past claim cost analysis and the premium projection model.

AVERAGE LENGTH OF STAY

What it is: The average length of time spent in hospital for an IP stay, usually averaged across all members having the same type of treatment in a specific study period e.g. the average length of stay for all eye surgery procedures in a particular calendar year.

Why it is important: The average length of stay can be used in many different ways, for example when assessing different healthcare providers or differences between public and private healthcare facilities. Stays that are too long or too short on a risk-adjusted basis could give an indication that investigation into these facilities is required.

DURATIONAL EFFECT

What it is: This refers to the impact of member duration (within a health program) on the propensity to claim. Typically claims experience is depressed when a health scheme begins – in this context – because there are a large number of members joining at once and it takes a while before members understand the benefits and how to make claims. As new cohorts of members join, they may experience similarly lower levels of initial claims.

Why it is important: Understanding the incidence rates by different cohorts of members by duration, helps with understanding of overall utilization trends. In a rapidly expanding scheme where the volume of new members in the early years far outnumber members who have been in the scheme for a little longer, incidence rates may appear to be stable or even decrease, however doing a cohort analysis (where there is sufficient data to do so), gives an indication of what the ultimate incidence rates could be once the scheme matures. Typically we expect both the frequency of claims per member and the average cost per claim to increase over time, all other factors held constant.

EXPOSURE (PERIOD OF COVERAGE)

What it is: Refers to the total length of time (in years) that scheme members have been insured i.e. it is the time that they have been 'exposed to risk and covered'. So, for example, a member who joined half way through the year would have half a year of exposure in that year.

Why it is important: We need exposure to calculate incidence rates for a full year of membership.

Why we use it rather than the count of members at a particular point in time (cross section or census): The count of members is useful as it gives us a snapshot in time of how many members are in the scheme, but it does not tell us much information about how long they have been in the scheme. For example, if we know that the membership count was 1 million on 31 December of a particular year, this statistic does not tell us whether they were all in the scheme for one year or one day. Exposure tells us how many life years members collectively contributed to each year. This is also needed for calculating incidence and other rates.

FAMILY UNIT

What it is: Family consists of head of family, spouse and any number of unmarried children.

Why it is important: The family is the unit of enrolment to the SSP.

HOUSEHOLD

What it is: A household is defined as the unit that lives within one housing structure and shares a common kitchen. This is a definition from the Government of Pakistan and not necessarily the ILO's or international understanding of a household.

Why it is important: It is possible for more than one family unit to share one household and this should be kept in mind when looking at census data. While family size is a parameter in the projection model, household size is not.

IBNR (INCURRED BUT NOT REPORTED)

What it is: Claims that are Incurred But Not Reported

Why it is important: With health insurance, there are usually cases where claims have occurred, but not been reported. This typically happens in the most recent months. Usually estimates are made to boost the claims in the last few months for IBNR claims. In this instance, due to automation of claims notification, we were informed it was not an issue for the SSP.

INCIDENCE (UTILIZATION) RATES

What they are: Number of IP claims per annum per 1,000 life years of the covered population (or per 1,000 families per annum where defined as such).

Why they are important: As a base for claim cost analysis and the premium projection model.

MEMBERSHIP AND CLAIMS EXPERIENCE ANALYSIS

What it is: A study of past claims and membership data to understand current rates and trends.

Why it is important: As a starting point for the projection model.

PREMIUM

What it is: In the context of this report, premium is defined as the gross premium. This is the amount that is expected to cover the cost of claims (i.e. the risk premium) and the TPA expenses.

Why it is important: This is the key output of the projection model.

RISK COST

What it is: Expected average cost of claims, in this case, per family per annum.

Why it is important: As an input in calculating the projected premiums (per family).

RBNP (REPORTED BUT NOT PAID)

What it is: Claims that are Reported But Not Paid.

Why it is important: There is usually a delay between claims being made and paid. When studying the claimed versus paid amounts, allowance needs to be made for the time-lag between these events. This time-lag is evident in the claims data, especially in 2018, and has been taken into account.

RISK PREMIUM

What is it: This is the part of the premium that is intended to cover the cost of claims.

Why it is important: When breaking down the premium into its component parts, we want to know that the risk premium is equal to the expected future claims. This is important for sustainability of the program.

RESERVES

What it is: In most insurance based schemes, it is important to hold reserves so that the premium or other income collected at the start of a period, which is intended to pay claims in the future, is set aside and guarded for this purpose. Depending on the time horizon of holding these reserves it may or may not be appropriate to invest them. Usually over shorter time periods, it is not appropriate given a cost versus benefit analysis of the potential return versus the costs involved and the investment risks. Different types of reserves are usually held for specific items, such as reserves for future unknown claims that have not yet been incurred or reserves for claims that have been reported but not paid.

Why it is important: Depending on how the premium or revenue collection is structured, the flows of money into a scheme may not exactly match the outflows on a year by year basis, for example, if three years of premiums are paid in advance, more money will be received in the first year than paid out, while in the later years more will be paid out than received. This is especially the case where a level premium is applied for a number of years but in fact the cost of claims over the same period are rising. Reserves are important to mitigate the risk around future claims being paid.

SCENARIO ANALYSIS

What it is: Different scenarios to model, for example how much investment income on reserves might reduce the required premium.

Why it is important: By being able to assess the impact of certain scenarios on the potential outcome, this can help with decision making.

STRESS TESTING

What it is: A process of taking model assumptions and changing/stressing them to model different potential future outcomes.

Why it is important: To measure the sensitivity of the results to different assumptions.

CAVEATS AND LIMITATIONS

Data reliance: In performing this analysis, data and other information provided by SLIC, the SSP and other external sources were used. These were not audited or verified, although checks were performed for reasonableness. Furthermore, there were no audited financials against which to reconcile the data we received. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. A limited review of the data was carried out for reasonableness and consistency. Initial checks revealed that the data was of suitable quality, however a detailed, systematic review of the accuracy of the data requested and received was beyond the scope of the ILO's engagement. No information was provided to conduct an expense analysis and so the adequacy of the expense assumptions provided could not be assessed. From SLIC, it is understood that the 16 per cent allowance was sufficient over Phase 1.

Variability of results: Differences between the projections and the actual outcomes depend on the extent to which future experience conforms to assumptions made for this analysis and projection. It is certain that actual experience will not conform exactly to the assumptions used in the projections. Actual experiences in the future will differ from projected results. Given that the results presented are initial findings, the results may change slightly as the model is further refined.

Use of this report: This report must be read in its entirety.

Supply side issues: There is lack of information about the supply side of care in Pakistan, and the impact of the lack of facilities and medical professions on the incidence caused by pent up demand for healthcare. While plans are underway to expand healthcare infrastructure in Pakistan, the pace of this expansion is unknown.

International social security standards and principles: A full review of Pakistan's health system against the ILO's social security standards, which include health protection, is beyond the scope of this assignment. However, for completeness it is important to mention the ILO Conventions and Recommendations which reference social health protection. Convention No. 102 is the ILO's landmark instrument that adopts a holistic vision of social security and sets minimum qualitative and quantitative benchmarks with respect to the nine social security contingencies, including sickness, maternity and employment injury benefits as well as old age, invalidity and death of the breadwinner, including administrative and financial rules for the good governance of social security systems. Over the years, it has become a world reference for the development of adequate and sustainable social security schemes, from policy design to implementation of parameters. In addition to the minimum levels established by Convention No. 102, the ILO has also adopted a set of higher standards for the various branches of social security, aiming at universal coverage and higher benefit levels.[15] The table in *Appendix B – Main requirements of ILO social security standards on health protection* summarises the main requirements of the different ILO Conventions and Recommendations which link to health protection, set out in three columns outlining the minimum standards, higher standards and basic protection. The ILO stands ready to offer support to any member state with respect to understanding and applying these or any of the other ILO Conventions.

This report has been prepared in accordance with the International Actuarial Association's International

[15] The Medical Care and Sickness Benefits Convention, 1969 (No. 130), and accompanying Recommendation No. 134, the Invalidity, Old Age and Survivors' Convention, 1967 (No. 128), and its accompanying Recommendation No. 131, Employment Injury Benefits Convention, 1964 [Schedule I amended in 1980] (No. 121), and its accompanying Recommendation No. 121, and the Maternity Protection Convention, 2000 (No. 183), and its accompanying Recommendation No. 191.

Standard of Actuarial Practice 1 (ISAP 1).

APPENDIX A – BASE TABLE AND PROJECTIONS

The Base Table below (Table 7) uses historical claims and membership data from 2016 and 2017 combined, and is therefore centred at 1st January 2017. These statistics are used as assumptions in the projection modelling. The projected Base Tables, for the Base Case Scenario, are presented in Table 9, Table 10 and Table 11.

Table 7: Base Table of starting costs as at 1 January 2017

Base Table of starting costs using combined data from 2016 and 2017

Per member per annum Risk Cost PKR	**167**
Adjusted per family per annum Risk Cost PKR	**1,044**

Medical/Surgical Category	Clinical Specialty	Average Length of Stay (LOS)	Incidence per 1,000 members per annum	Average Cost per IP Event	Per member per annum Risk Cost PKR
Diagnostics	Cardiology	1.70	0.14	24,997	3.40
	Diagnostic endoscopy	2.40	0.02	13,748	0.25
	Diagnostics - Cardiology	3.30	0.00	22,040	0.10
	Diagnostics radiology CT	-	0.00	15,000	0.00
	ENT surgery	1.00	0.00	27,350	0.00
	Gastrointestinal surgery	4.62	0.00	52,793	0.10
	Intervention radiology	-	0.00	8,910	0.00
	Medical management	2.63	0.00	14,650	0.02
	Unclear	4.00	0.00	73,817	0.01
	Urinary surgery	2.67	0.00	23,939	0.03
Diagnostics Total		**1.87**	**0.16**	**23,897**	**3.92**
Maternity Medical	Female genital surgery	0.73	0.36	13,515	4.93
	Medical management	1.80	0.00	3,800	0.00
Maternity Medical Total		**0.73**	**0.37**	**13,496**	**4.93**
Maternity Surgical	Female genital surgery	2.20	0.55	15,798	8.68
Maternity Surgical Total		**2.20**	**0.55**	**15,798**	**8.68**
Medical	Burns	7.00	0.00	40,175	0.01
	Cardiac surgery	1.00	0.00	36,207	0.01
	Cardiology	2.67	0.00	59,096	0.08
	Eye surgery	0.67	0.00	9,725	0.01
	Gastrointestinal surgery	2.26	0.01	24,857	0.19
	Medical management	2.58	2.03	9,894	20.05
	Musculoskeletal surgery	1.24	0.01	10,616	0.06
	Oncomedical	1.82	0.05	28,424	1.43
	Respiratory surgery	2.00	0.00	15,350	0.00
	Skin and soft tissue surgery	3.50	0.00	13,237	0.01
	Unclear	2.19	0.03	8,781	0.25
	Urinary surgery	1.57	0.00	23,393	0.02
Medical Total		**2.56**	**2.12**	**10,415**	**22.11**
Surgical	Burns	1.00	0.00	25,350	0.00
	Cardiac surgery	4.61	0.13	225,370	30.26
	Endocrine surgery	3.71	0.04	39,120	1.37
	ENT surgery	1.66	0.31	21,671	6.67
	Eye surgery	1.67	0.33	16,430	5.35
	Female genital surgery	2.68	0.55	28,076	15.56
	Gastrointestinal surgery	2.23	1.14	23,815	27.11
	Hepatobilliary surgery	2.92	0.29	32,598	9.43
	Intervention radiology	0.50	0.00	62,865	0.02
	Male genital surgery	2.18	0.09	22,633	2.14
	Musculoskeletal surgery	2.68	0.34	31,976	11.03
	Neurosurgery	3.33	0.01	58,560	0.50
	Oncosurgery	4.63	0.00	111,923	0.48
	Oral surgery	2.67	0.01	31,081	0.24
	Respiratory surgery	6.17	0.00	48,067	0.04
	Skin and soft tissue surgery	1.81	0.15	16,007	2.35
	Unclear	4.82	0.00	26,547	0.08
	Urinary surgery	3.32	0.27	33,376	8.89
	Vascular surgery	2.86	0.03	21,259	0.57
Surgical Total		**2.47**	**3.69**	**33,096**	**122.12**
Other Total	Other	**3.23**	**0.13**	**37,215**	**4.90**
Grand Total					**166.66**

The tables in Appendix A come from the projection model and are based on assumptions for the "Base Scenario", which assumes relatively low incidence rates. This single projection should NOT be looked at in isolation. Please refer back to the body of the report for more information.

Table 8: Base Table at 1st January 2017 with new benefits and limits

Base Table at:	1st January 2017 with new benefits and raised limits

Per member per annum Risk Cost PKR	191
Per family per annum Risk Cost PKR	1,195

Medical/Surgical Category	Clinical Specialty	Average Length of Stay (LOS)	Incidence per 1,000 members per annum	Average Cost per IP Event	Per member per annum Risk Cost PKR
Diagnostics	Cardiology	1.70	0.14	25,497	3.53
	Diagnostic endoscopy	2.40	0.02	14,023	0.26
	Diagnostics - Cardiology	3.30	0.00	22,481	0.11
	Diagnostics radiology CT	-	0.00	15,300	0.00
	ENT surgery	1.00	0.00	27,897	0.00
	Gastrointestinal surgery	4.62	0.00	53,849	0.10
	Intervention radiology	-	0.00	9,088	0.00
	Medical management	2.63	0.00	14,943	0.02
	Unclear	4.00	0.00	75,293	0.01
	Urinary surgery	2.67	0.00	24,418	0.03
Diagnostics Total		**1.87**	**0.17**	**24,375**	**4.08**
Maternity Medical	Female genital surgery	0.73	0.37	13,785	5.13
	Medical management	1.80	0.00	3,876	0.00
New	***Post-partum family planning counselling**	-	0.37	408	0.15
New	***Contraceptive technologies**	-	0.37	408	0.15
New	***Counselling on immunization**	-	0.37	408	0.15
Maternity Medical Total		**0.73**	**0.37**	**14,990**	**5.59**
Maternity Surgical	Female genital surgery	2.20	0.56	16,114	9.03
New	***Post-partum family planning counselling**	-	0.56	408	0.22
New	***Contraceptive technologies**	-	0.56	408	0.22
New	***Counselling on immunization**	-	0.56	408	0.22
Maternity Surgical Total		**2.20**	**0.56**	**17,290**	**9.69**
Medical	Burns	7.00	0.00	40,979	0.01
	Cardiac surgery	1.00	0.00	36,931	0.01
	Cardiology	2.67	0.00	60,278	0.08
	Eye surgery	0.67	0.00	9,920	0.01
	Gastrointestinal surgery	2.26	0.01	25,354	0.20
	Medical management	2.58	2.07	10,091	20.86
	Musculoskeletal surgery	1.24	0.01	10,829	0.06
	Oncomedical	1.82	0.05	28,993	1.48
	Respiratory surgery	2.00	0.00	15,657	0.00
	Skin and soft tissue surgery	3.50	0.00	13,502	0.01
	Unclear	2.19	0.03	8,957	0.26
	Urinary surgery	1.57	0.00	23,861	0.02
New	***New benefit - follow up after surgery**	-	2.17	1,530	3.31
Medical Total		**2.56**	**2.17**	**12,153**	**26.31**
Surgical	Burns	1.00	0.00	25,857	0.00
	Cardiac surgery	4.61	0.14	229,877	31.49
	Endocrine surgery	3.71	0.04	39,902	1.43
	ENT surgery	1.66	0.31	22,104	6.94
	Eye surgery	1.67	0.33	16,758	5.57
	Female genital surgery	2.68	0.57	28,637	16.19
	Gastrointestinal surgery	2.23	1.16	24,291	28.21
	Hepatobilliary surgery	2.92	0.30	33,250	9.81
	Intervention radiology	0.50	0.00	64,122	0.02
	Male genital surgery	2.18	0.10	23,085	2.23
	Musculoskeletal surgery	2.68	0.35	32,616	11.48
	Neurosurgery	3.33	0.01	59,731	0.52
	Oncosurgery	4.63	0.00	114,161	0.50
	Oral surgery	2.67	0.01	31,702	0.25
	Respiratory surgery	6.17	0.00	49,028	0.04
	Skin and soft tissue surgery	1.81	0.15	16,327	2.45
	Unclear	4.82	0.00	27,078	0.09
	Urinary surgery	3.32	0.27	34,044	9.25
	Vascular surgery	2.86	0.03	21,684	0.60
New	***New benefit - follow up after surgery**	-	3.76	1,530	5.53
Surgical Total		**2.47**	**3.76**	**35,229**	**132.59**
Other Benefits including non-medical benefits (e.g. transportation)					**12.26**
Grand Total					**190.52**

The tables in Appendix A come from the projection model and are based on assumptions for the "Base Scenario", which assumes relatively low incidence rates. This single projection should NOT be looked at in isolation. Please refer back to the body of the report for more information.

Table 9: Base Table Projected to 30th June 2019 (Base Case Scenario only)

Projected to: 30th June 2019

Per member per annum Risk Cost PKR	221
Per family per annum Risk Cost PKR	1,384

Medical/Surgical Category	Clinical Specialty	Average Length of Stay (LOS)	Incidence per 1,000 members per annum	Average Cost per IP Event	Per member per annum Risk Cost PKR
Diagnostics	Cardiology	1.70	0.14	29,080	4.11
	Diagnostic endoscopy	2.40	0.02	15,994	0.31
	Diagnostics - Cardiology	3.30	0.00	25,641	0.13
	Diagnostics radiology CT	-	0.00	17,450	0.01
	ENT surgery	1.00	0.00	31,818	0.00
	Gastrointestinal surgery	4.62	0.00	61,417	0.12
	Intervention radiology	-	0.00	10,366	0.00
	Medical management	2.63	0.00	17,043	0.02
	Unclear	4.00	0.00	85,875	0.01
	Urinary surgery	2.67	0.00	27,849	0.04
Diagnostics Total		**1.87**	**0.17**	**27,801**	**4.74**
Maternity Medica	Female genital surgery	0.73	0.38	15,722	5.96
	Medical management	1.80	0.00	4,421	0.00
New	***Post-partum family planning counselli**	-	0.38	465	0.18
New	***Contraceptive technologies**	-	0.38	465	0.18
New	***Counselling on immunization**	-	0.38	465	0.18
Maternity Medical Total		**0.73**	**0.38**	**17,096**	**6.49**
Maternity Surgica	Female genital surgery	2.20	0.57	18,379	10.50
New	***Post-partum family planning counselli**	-	0.57	465	0.27
New	***Contraceptive technologies**	-	0.57	465	0.27
New	***Counselling on immunization**	-	0.57	465	0.27
Maternity Surgical Total		**2.20**	**0.57**	**19,775**	**11.30**
Medical	Burns	7.00	0.00	46,738	0.01
	Cardiac surgery	1.00	0.00	42,122	0.01
	Cardiology	2.67	0.00	68,749	0.09
	Eye surgery	0.67	0.00	11,314	0.01
	Gastrointestinal surgery	2.26	0.01	28,917	0.23
	Medical management	2.58	2.11	11,510	24.25
	Musculoskeletal surgery	1.24	0.01	12,351	0.07
	Oncomedical	1.82	0.05	33,068	1.72
	Respiratory surgery	2.00	0.00	17,858	0.00
	Skin and soft tissue surgery	3.50	0.00	15,400	0.01
	Unclear	2.19	0.03	10,215	0.31
	Urinary surgery	1.57	0.00	27,214	0.03
New	***New benefit - follow up after surgery**	-	2.21	1,745	3.85
Medical Total		**2.56**	**2.21**	**13,861**	**30.58**
Surgical	Burns	1.00	0.00	29,491	0.00
	Cardiac surgery	4.61	0.14	262,186	36.60
	Endocrine surgery	3.71	0.04	45,510	1.66
	ENT surgery	1.66	0.32	25,211	8.07
	Eye surgery	1.67	0.34	19,114	6.47
	Female genital surgery	2.68	0.58	32,662	18.82
	Gastrointestinal surgery	2.23	1.18	27,705	32.78
	Hepatobilliary surgery	2.92	0.30	37,923	11.41
	Intervention radiology	0.50	0.00	73,134	0.02
	Male genital surgery	2.18	0.10	26,330	2.59
	Musculoskeletal surgery	2.68	0.36	37,200	13.34
	Neurosurgery	3.33	0.01	68,126	0.61
	Oncosurgery	4.63	0.00	130,206	0.58
	Oral surgery	2.67	0.01	36,158	0.29
	Respiratory surgery	6.17	0.00	55,919	0.05
	Skin and soft tissue surgery	1.81	0.15	18,622	2.84
	Unclear	4.82	0.00	30,884	0.10
	Urinary surgery	3.32	0.28	38,829	10.75
	Vascular surgery	2.86	0.03	24,731	0.69
New	***New benefit - follow up after surgery**	-	3.84	1,745	6.69
Surgical Total		**2.47**	**3.84**	**40,248**	**154.37**
Other Benefits including non-medical benefits (e.g. transportation)					**13.23**
Grand Total					**220.71**

The tables in Appendix A come from the projection model and are based on assumptions for the "Base Scenario", which assumes relatively low incidence rates. This single projection should NOT be looked at in isolation. Please refer back to the body of the report for more information.

Table 10: Base Table Projected to 30th June 2020 (Base Case Scenario only)

Projected to: 30th June 2020

Per member per annum Risk Cost PKR	238
Per family per annum Risk Cost PKR	1,495

Medical/Surgical Category	Clinical Specialty	Average Length of Stay (LOS)	Incidence per 1,000 members per annum	Average Cost per IP Event	Per member per annum Risk Cost PKR
Diagnostics	Cardiology	1.70	0.14	31,306	4.45
	Diagnostic endoscopy	2.40	0.02	17,218	0.33
	Diagnostics - Cardiology	3.30	0.00	27,603	0.14
	Diagnostics radiology CT	-	0.00	18,786	0.01
	ENT surgery	1.00	0.00	34,252	0.01
	Gastrointestinal surgery	4.62	0.00	66,117	0.13
	Intervention radiology	-	0.00	11,159	0.00
	Medical management	2.63	0.00	18,347	0.02
	Unclear	4.00	0.00	92,447	0.01
	Urinary surgery	2.67	0.00	29,980	0.04
Diagnostics Total		**1.87**	**0.17**	**29,929**	**5.13**
Maternity Medica	Female genital surgery	0.73	0.38	16,925	6.45
	Medical management	1.80	0.00	4,759	0.00
New	***Post-partum family planning counselli**	-	0.38	501	0.19
New	***Contraceptive technologies**	-	0.38	501	0.19
New	***Counselling on immunization**	-	0.38	501	0.19
Maternity Medical Total		**0.73**	**0.38**	**18,404**	**7.03**
Maternity Surgica	Female genital surgery	2.20	0.57	19,785	11.37
New	***Post-partum family planning counselli**	-	0.57	501	0.29
New	***Contraceptive technologies**	-	0.57	501	0.29
New	***Counselling on immunization**	-	0.57	501	0.29
Maternity Surgical Total		**2.20**	**0.57**	**21,288**	**12.23**
Medical	Burns	7.00	0.00	50,314	0.01
	Cardiac surgery	1.00	0.00	45,345	0.01
	Cardiology	2.67	0.00	74,010	0.10
	Eye surgery	0.67	0.00	12,179	0.01
	Gastrointestinal surgery	2.26	0.01	31,130	0.25
	Medical management	2.58	2.12	12,390	26.25
	Musculoskeletal surgery	1.24	0.01	13,296	0.07
	Oncomedical	1.82	0.05	35,598	1.87
	Respiratory surgery	2.00	0.00	19,224	0.00
	Skin and soft tissue surgery	3.50	0.00	16,578	0.01
	Unclear	2.19	0.03	10,997	0.33
	Urinary surgery	1.57	0.00	29,297	0.03
New	***New benefit - follow up after surgery**	-	2.22	1,879	4.17
Medical Total		**2.56**	**2.22**	**14,922**	**33.11**
Surgical	Burns	1.00	0.00	31,748	0.00
	Cardiac surgery	4.61	0.14	282,248	39.62
	Endocrine surgery	3.71	0.04	48,993	1.80
	ENT surgery	1.66	0.32	27,140	8.74
	Eye surgery	1.67	0.34	20,576	7.00
	Female genital surgery	2.68	0.58	35,161	20.37
	Gastrointestinal surgery	2.23	1.19	29,825	35.49
	Hepatobilliary surgery	2.92	0.30	40,825	12.35
	Intervention radiology	0.50	0.00	78,731	0.02
	Male genital surgery	2.18	0.10	28,345	2.80
	Musculoskeletal surgery	2.68	0.36	40,046	14.44
	Neurosurgery	3.33	0.01	73,339	0.66
	Oncosurgery	4.63	0.00	140,169	0.63
	Oral surgery	2.67	0.01	38,924	0.32
	Respiratory surgery	6.17	0.00	60,197	0.05
	Skin and soft tissue surgery	1.81	0.15	20,047	3.08
	Unclear	4.82	0.00	33,247	0.11
	Urinary surgery	3.32	0.28	41,800	11.64
	Vascular surgery	2.86	0.03	26,624	0.75
New	***New benefit - follow up after surgery**	-	3.86	1,879	7.25
Surgical Total		**2.47**	**3.86**	**43,328**	**167.11**
Other Benefits including non-medical benefits (e.g. transportation)					**13.76**
Grand Total					**238.37**

The tables in Appendix A come from the projection model and are based on assumptions for the "Base Scenario", which assumes relatively low incidence rates. This single projection should NOT be looked at in isolation. Please refer back to the body of the report for more information.

Table 11: Base Table Projected to 30th June 2021 (Base Case Scenario only)

Projected to: 30th June 2021

Per member per annum Risk Cost PKR	256
Per family per annum Risk Cost PKR	1,607

Medical/Surgical Category	Clinical Specialty	Average Length of Stay (LOS)	Incidence per 1,000 members per annum	Average Cost per IP Event	Per member per annum Risk Cost PKR
Diagnostics	Cardiology	1.70	0.14	33,367	4.79
	Diagnostic endoscopy	2.40	0.02	18,352	0.36
	Diagnostics - Cardiology	3.30	0.00	29,420	0.15
	Diagnostics radiology CT	-	0.00	20,023	0.01
	ENT surgery	1.00	0.00	36,508	0.01
	Gastrointestinal surgery	4.62	0.00	70,470	0.14
	Intervention radiology	-	0.00	11,893	0.00
	Medical management	2.63	0.00	19,555	0.02
	Unclear	4.00	0.00	98,533	0.01
	Urinary surgery	2.67	0.00	31,954	0.04
Diagnostics Total		**1.87**	**0.17**	**31,899**	**5.52**
Maternity Medica	Female genital surgery	0.73	0.39	18,040	6.95
	Medical management	1.80	0.00	5,072	0.00
New	***Post-partum family planning counselli**	-	0.39	534	0.21
New	***Contraceptive technologies**	-	0.39	534	0.21
New	***Counselling on immunization**	-	0.39	534	0.21
Maternity Medical Total		**0.73**	**0.39**	**19,616**	**7.57**
Maternity Surgical	Female genital surgery	2.20	0.58	21,088	12.24
New	***Post-partum family planning counselli**	-	0.58	534	0.31
New	***Contraceptive technologies**	-	0.58	534	0.31
New	***Counselling on immunization**	-	0.58	534	0.31
Maternity Surgical Total		**2.20**	**0.58**	**22,689**	**13.17**
Medical	Burns	7.00	0.00	53,627	0.02
	Cardiac surgery	1.00	0.00	48,330	0.01
	Cardiology	2.67	0.00	78,883	0.11
	Eye surgery	0.67	0.00	12,981	0.01
	Gastrointestinal surgery	2.26	0.01	33,179	0.26
	Medical management	2.58	2.14	13,206	28.27
	Musculoskeletal surgery	1.24	0.01	14,171	0.08
	Oncomedical	1.82	0.05	37,942	2.01
	Respiratory surgery	2.00	0.00	20,490	0.00
	Skin and soft tissue surgery	3.50	0.00	17,670	0.01
	Unclear	2.19	0.03	11,721	0.36
	Urinary surgery	1.57	0.00	31,226	0.03
New	***New benefit - follow up after surgery**	-	2.24	2,002	4.49
Medical Total		**2.56**	**2.24**	**15,904**	**35.66**
Surgical	Burns	1.00	0.00	33,838	0.01
	Cardiac surgery	4.61	0.14	300,832	42.67
	Endocrine surgery	3.71	0.04	52,218	1.93
	ENT surgery	1.66	0.33	28,927	9.41
	Eye surgery	1.67	0.34	21,931	7.54
	Female genital surgery	2.68	0.59	37,477	21.94
	Gastrointestinal surgery	2.23	1.20	31,788	38.23
	Hepatobilliary surgery	2.92	0.31	43,513	13.30
	Intervention radiology	0.50	0.00	83,914	0.03
	Male genital surgery	2.18	0.10	30,211	3.02
	Musculoskeletal surgery	2.68	0.36	42,683	15.55
	Neurosurgery	3.33	0.01	78,168	0.71
	Oncosurgery	4.63	0.00	149,398	0.67
	Oral surgery	2.67	0.01	41,487	0.34
	Respiratory surgery	6.17	0.00	64,161	0.06
	Skin and soft tissue surgery	1.81	0.16	21,367	3.32
	Unclear	4.82	0.00	35,436	0.12
	Urinary surgery	3.32	0.28	44,552	12.54
	Vascular surgery	2.86	0.03	28,377	0.81
New	***New benefit - follow up after surgery**	-	3.90	2,002	7.80
Surgical Total		**2.47**	**3.90**	**46,180**	**179.99**
Other Benefits including non-medical benefits (e.g. transportation)					**14.33**
Grand Total					**256.25**

The tables in Appendix A come from the projection model and are based on assumptions for the "Base Scenario", which assumes relatively low incidence rates. This single projection should NOT be looked at in isolation. Please refer back to the body of the report for more information.

APPENDIX B – MAIN REQUIREMENTS OF ILO SOCIAL SECURITY STANDARDS ON HEALTH PROTECTION

	ILO Convention No. 102 Minimum standards	ILO Convention No. 130 and Recommendation No. 134 [1] Higher standards	ILO Recommendation No. 202 Basic protection
What should be covered?	Any ill health condition, whatever its cause; pregnancy, childbirth and their consequences.	The need for medical care of curative and preventive nature.	Any condition requiring health care, including maternity.
Who should be protected?	At least: – 50% of all employees, and wives and children; *or* – categories of the economically active population (forming not less than 20% of all residents, and wives and children); *or* – all residents with means under prescribed threshold.	**C.130:** All employees, including: – apprentices, and their wives and children; *or* – categories of the active population forming not less than 75% of whole active population, and their wives and children; *or* – prescribed class of residents forming not less than 75% of all residents. **R.134:** In addition: persons in casual employment and their families, family businesses, all economically active persons and their families, all residents.	Universality of protection, through progressive realization; at least all residents and children should benefit from basic guarantee of access to at least essential health care; non-residents should also be in line with the country's international obligations.
What should the benefit be?	In case of ill health: general practitioner care, specialist care at hospitals, essential medications and supplies, hospitalization if necessary. In case of pregnancy, childbirth and their consequences: prenatal, childbirth and post-natal care by medical practitioners and qualified midwives, hospitalization if necessary.	**C.130:** The medical care required by the person's condition, with a view to maintaining, restoring or improving health and ability to work and attend to personal needs, including at least: general practitioner care, specialist care at hospitals, allied care and benefits, essential medical supplies, hospitalization if necessary, dental care and medical rehabilitation. **R.134:** In addition: the supply of medical aids (e.g. eyeglasses) and services for convalescence.	Goods and services constituting *essential health care*, including maternity care, meeting accessibility, availability, acceptability and quality criteria; free prenatal and post-natal medical care for the most vulnerable; higher levels of protection should be provided to as many people as possible, as soon as possible.
What should the benefit duration be?	As long as ill health, or pregnancy and childbirth and their consequences, persist. May be limited to 26 weeks in each case of sickness. Benefit should not be suspended while beneficiary receives sickness benefits or is treated for a disease recognized as requiring prolonged care.	**C.130:** Throughout the contingency.	As long as ill health, or pregnancy and childbirth and their consequences, persist. May be limited to 26 weeks in each case of sickness. Benefit should not be suspended while beneficiary receives sickness benefits or is treated for a disease recognized as requiring prolonged care.
What conditions can be prescribed for entitlement to a benefit?	Qualifying period may be prescribed as necessary to preclude abuse.	**C.130:** Qualifying period may be prescribed as necessary to preclude abuse. **R.134:** Right to benefit should not be subject to qualifying period.	Persons in need of health care should not face hardship and an increased risk of poverty due to financial consequences of accessing essential health care. Should be defined at national level and prescribed by law, applying principles of non-discrimination, responsiveness to special needs and social inclusion, and ensuring the rights and dignity of people.

[1] Medical Care and Sickness Benefits Convention, 1969, and Recommendation, 1969.

SOCIAL FINANCE

The ILO's Social Finance Programme works with the financial sector to enable it to contribute to the ILO's Decent Work Agenda. In this context, we engage with banks, microfinance institutions, credit unions, insurers, investors and others to test new financial products approaches and processes.

IMPACT INSURANCE FACILITY

The Impact Insurance Facility contributes to the Social Finance agenda by collaborating with the insurance industry, governments and partners to realize the potential of insurance for social and economic development.

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