



International
Labour
Office
Geneva

MANUAL FOR THE GHANA DISTRICT HEALTH INSURANCE BUDGETING MODEL

**Social Security Department
International Labour Office**

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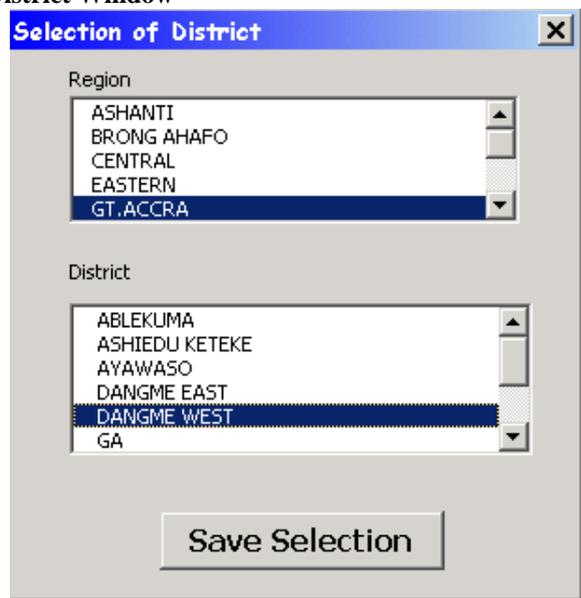
Using the Model

The following manual will guide you step by step in the use of the Ghana District Health Insurance Budgeting Model. The Model consists of a Tool to develop the budget projection at a district level. The model is composed of a series of Pop up windows in Microsoft Excel environment, the purpose of those windows is to store the different inputs needed to develop a budget or to make the corresponding budget report.

1. District Selection

It is recommended to Copy the file “Ghana District Model.xls” to the Hard Disk and once there open it. The first time the file is opened, the window “Selection of District” composed of two lists will open up. The first list includes the different regions. Once the region has been chosen, the second list will show the different districts of the corresponding region.

Figure 1: Selection of District Window



After choosing the correct District, the selection can be saved using the corresponding button in the Form. The District selection window will appear only once, the first time this file is opened, all the future times the file is opened it will maintain the District used the first time as a default value¹.

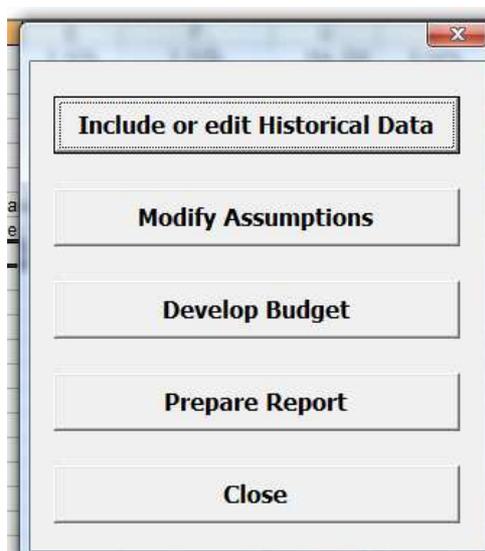
2. Main Window

The first window that will appear (the only exception is the first time the file is used) corresponds to the “Main Window”, composed of four buttons which provide the options to access the different input inclusion windows and the window designed to develop the report.

¹ If the choice of District is incorrect, the way to correct it is to close the file before selecting the “Include or edit Historical Data” button in the next window or at least before selecting “Save Data” in the “Introduction of Historical Data” window. If there is any historical data saved, the incorrect choice of District only can be solved by copying a new file “Ghana District Model.xls” in the Hard Disk.

The inputs used in the Budget projection, correspond to two types: “Past Data” and “Assumptions”. The first kind of input could be included pressing the button “Include or edit Historical Data” in the “Main Window, this action makes appear the window: “Introduction of Historical Data” in the screen.

Figure 2: Main Window



3. Introduction of Historical Data

The window “Introduction of Historical Data” must be filled with data of years prior to 2005. If projections are being done from 2008 on wards and historical data has been entered for 2005 then historical data must be entered for 2006 and 2007 also. There can be no empty data years. The first time the program is used as there is no Past Data included in the file, the window will ask for the data of 2005 with all the fields except the one for the year with values of 0.

Figure 3: Introduction of Historical Data window for a new file

| YEAR | | 2005 | |
|--|---|------------------------------|-----|
| Population | | | |
| Total | 0 | Covered | 0 |
| Under 18 | 0 | 70 years and above | 0 |
| | | Indigent | 0 |
| | | SSNIT Pensioners | 0 |
| | | SSNIT Contributors | 0 |
| Costs | | | |
| Total Cost of Primary Care | 0 | Number of Contacts | 0 |
| Total Cost of Outpatient Care for Referral Cases | 0 | Number of Contacts | 0 |
| Total Cost of Inpatient Care for Referral Cases | 0 | Number of Admissions | 0 |
| Administration Cost | 0 | | |
| Premium | 0 | | |
| Income | | | |
| Insurance Premium | 0 | Other Income | 0 |
| Subsidies from NHIS (Exempt Groups) | 0 | Rate of Return on Investment | 0 % |
| Administrative Support | 0 | | |

Save data

In the cases where there is some Past Data included in the file, the window will show the information stored for the last year.

Figure 4: Introduction of Historical Data window for a file with previous data

| YEAR | | 2005 | |
|--|-----------|------------------------------|-----------|
| Population | | | |
| Total | 110066 | Covered | 13523 |
| Under 18 | 5197 | 70 years and above | 525 |
| | | Indigent | 5000 |
| | | SSNIT Pensioners | 330 |
| | | SSNIT Contributors | 7000 |
| Costs | | | |
| Total Cost of Primary Care | 613841374 | Number of Contacts | 17930 |
| Total Cost of Outpatient Care for Referral Cases | 58817680 | Number of Contacts | 830 |
| Total Cost of Inpatient Care for Referral Cases | 35364675 | Number of Admissions | 103 |
| Administration Cost | 564655771 | | |
| Premium | 72000 | | |
| Income | | | |
| Insurance Premium | 310573933 | Other Income | 111104000 |
| Subsidies from NHIS (Exempt Groups) | 698960000 | Rate of Return on Investment | 15.45 % |
| Administrative Support | 346728625 | | |

Save data

It is always possible to modify data of previous years. For this it is necessary only to type the year for which information needs to be edited. The window will show the existing information. These can now be modified and as in the case of new data they can be saved by selecting the “Save Data” button. To include data for a new year, the

year must be put in the corresponding field, and the values of zero must be replaced by the corresponding information before saving.

The different fields for the introduction of Historical Data are divided into three main groups.

The first one is related to population and is composed of the Total population, the Covered population, the number of Indigents, the group of persons less than 18 years old, the elderly who are 70 years or older, the number of Pensioners and Contributors to the SSNIT.

The second group corresponds to the data about costs. It includes the Total Cost for three different treatment types: i) the outpatient care provided as part of the primary care (all the primary care is by definition outpatient care), ii) the Outpatient care given following a system of referrals and iii) the inpatient care given also after medical referral. The number of contacts (consults) is the indicator of use of the first two treatment types, and the number of Hospital admissions corresponds to the indicator of use of the third. The Administration cost is another indicator of cost required as Historical Data and finally the Individual premium charged to the insured in order and subsidized for the exempted.

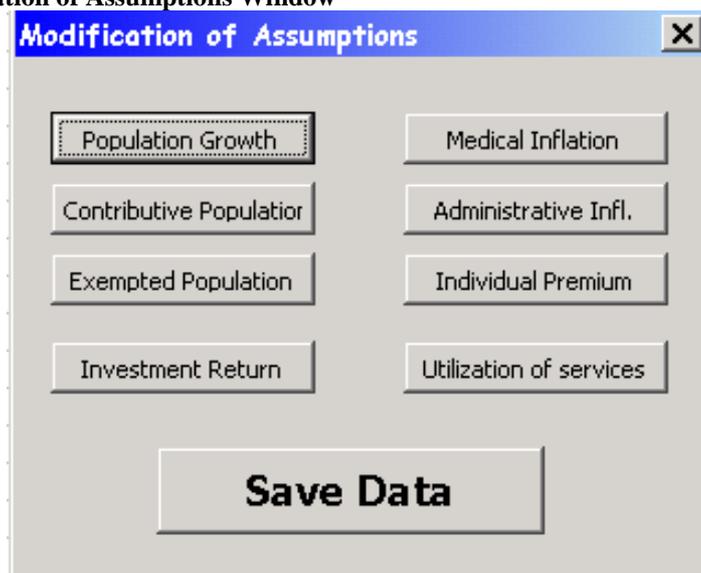
The final group corresponds to the income. Here information is required on income received such as Insurance Premium for the covered people, the Subsidy received from the NHIS for the exempted, the Administrative Support from the NHIS, all the Other Income received and finally the Investment Return (91 day treasury bill interest rate).

None of the fields in the “Introduction of Historical Data” window can be filled with a negative values. If values are negative, the program will ask to change the value to a value greater than zero. Finally, any entries which are not a number will create an error in the program.

4. Modification of Assumptions

Once the data in the “Introduction of Historical Data” window has been saved, the program returns to the “Main Window”. The second option proposes the modifications of assumptions for projections through the “Modify Assumptions” window.

Figure 5: Modification of Assumptions Window



The “Modification of Assumptions” window is composed of nine buttons, the last one “Save Data” returns the user to the “Main Window” all the others allow the user to modify the different assumptions for the projections. For the first use of the model, a certain number of assumptions have been entered. However, these should be carefully checked and modified. The assumptions are the most important part of any budgeting exercise, especially because any considerable change in the assumed values could have enormous consequences in the projected result.

The assumptions asked in the “Modification of Assumptions” window correspond to Population Growth, Medical Inflation, Contributive Population (as a percentage of total population), Exempted Population (as a percentage of total population), Administrative Inflation, Individual Premium, Investment Return and Utilization of Services. The former seven can be modified in a very similar way, because all the windows available to do so are similar. The example of Population Growth Assumption is shown in the next figure:

Figure 6: Population Growth Assumption Window

| Year | Assumption (%) |
|------|----------------|
| 2007 | 2.6 % |
| 2008 | 2.6 % |
| 2009 | 2.6 % |
| 2010 | 2.6 % |
| 2011 | 2.6 % |
| 2012 | 2.6 % |
| 2013 | 2.6 % |
| 2014 | 2.6 % |
| 2015 | 2.6 % |
| 2016 | 2.6 % |
| 2017 | 2.6 % |
| 2018 | 2.6 % |
| 2019 | 2.6 % |
| 2020 | 2.6 % |
| 2021 | 2.6 % |
| 2022 | 2.6 % |
| 2023 | 2.6 % |
| 2024 | 2.6 % |
| 2025 | 2.6 % |
| 2026 | 2.6 % |

Save Changes

It is necessary to modify the value assumed for each of the years of the assumption (a maximum of 20), if the scope of the projection is less than 20 years, it is recommended to fill the years prior to the end of projection with the same data as the last projected year or simply maintain the current values given that the projection will not be affected by those values.

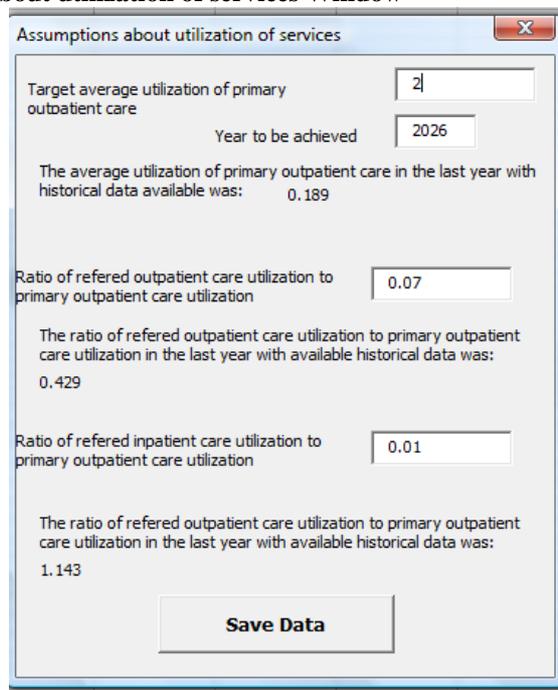
None of the fields in any of the forms can stay blank, nor can they be filled with text strings. Also in the case of the assumptions on Contributive and Exempted populations, the sum of both values must be between 0% and 100%. Negative values are not possible for the Individual Insurance Premium.

The “Assumptions about utilization of services” window has a different format than the other assumptions’ windows. The first field corresponds to the target utilization of services, the second corresponds to the year by when such a target is to be accomplished. The implicit assumption is that the target is achieved in a linear way between the current value of the utilization of primary outpatient care and the target for the number of years between the last historical year included and the target year. Once the target is achieved it is implicitly assumed that this utilization indicator will stay constant for the rest of the projection period.

The second indicator corresponds to the ratio of referred outpatient care utilization to primary outpatient care utilization; it is the number of references to outpatient care produced by one primary care consultation.

The third finally is the ratio of referred inpatient care utilization to primary outpatient care utilization (number or admissions to number of primary care contacts).

Figure 7: Assumptions about utilization of services Window

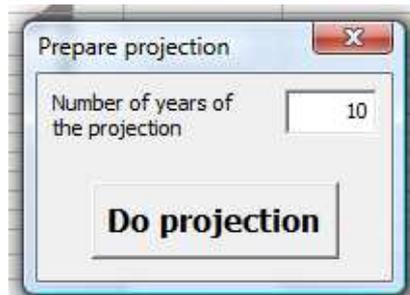


After saving the information, the “Save Data” button returns the user to the “Modification of Assumptions” window.

5. Develop Budget

Once the historical data has been entered (see section 3) and the assumptions have been entered (see section 4), in the “Main Window” the third button, consists of the “Develop Budget” button. By selecting this option, the user is sent to the “Prepare Projection” window where the only input required corresponds to the Number of Years for the Projection. The default value of this button, corresponds to the number of years of projections used the last time the program was run. The “Do projection” button refreshes the projected values with the new inputs (Historical Data, Assumptions and number or years of projection) and sends the user back to the “Main Window”. It is always recommended to go to this step before preparing the report of the projections in order to at least check that the number of years which will be projected is consistent with the number of years the user requires.

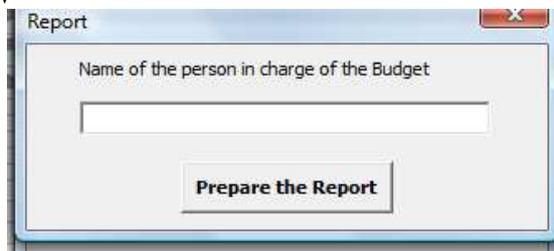
Figure 8: Prepare Projection Window



6. Prepare Report

The fourth button in the “Main Window” corresponds to the “Prepare Report” option which brings the user to the “Report” window. In this window the only input asked from the user is his/her name. Selecting the “Prepare the Report” button starts the program execution process.

Figure 9: Report Window

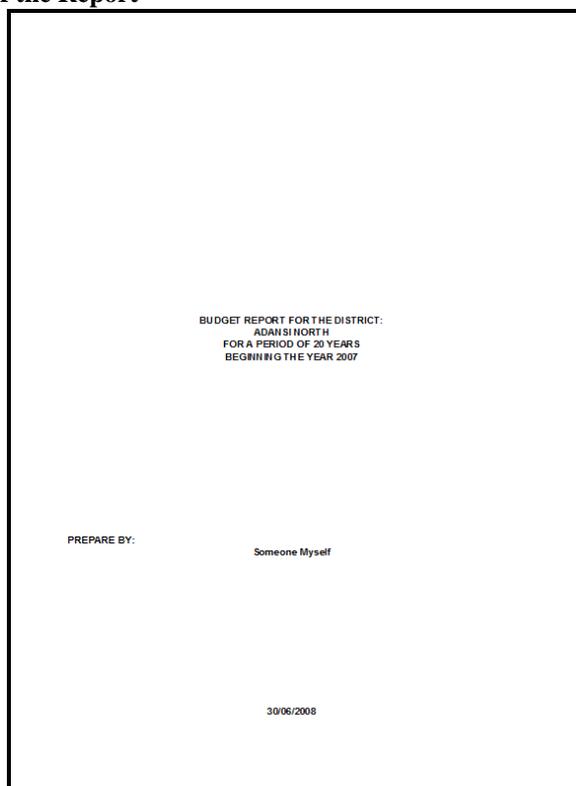


The program saves all the changes done in “Ghana District Model.xls” and closes the file. The program opens a new file in which the report is generated. The user needs to save this file with a name. Once this has been done, the file can be sent by e-mail or printed out as a report.

7. Report Structure

The report will consist in three or four pages, depending in how many years of projection were selected, and two charts. The first page corresponds to the “Front Page”, which includes the Name of the District, First year of projection, Number of years projected, name of the user and Date.

Figure 10: Front Page of the Report



The second page of the Report corresponds to a Assumptions Page, where all the Assumptions used in the Budget development are listed. The third consists in a

summary of the Past Data presented in three main sections: Population, Costs and Income and Expenditure Statement. This provides an abstract of all the information provided in the “Introduction of Historical Data” window from 2005 until the last year available.

The page or pages of “Result” consistent in an abstract of the Budget. These page have the same structure of presentation of information as the “Past Data” page. The results for 10 years of projections will show on one page. The subsequent years will show on the next page.

Figure 11: Front Page of the Report

| ASSUMPTIONS FOR THE BUDGET PROJECTION OF THE DISTRICT OF ADANS NORTH 30/06/2008 | | | | | | | | | |
|--|-------------------|--------|-------------|-----------------|-------------------|--------------------------|--------------------|-------------------|-------------|
| Year | Population Growth | People | Floor Ratio | Target Coverage | Medical Inflation | Administrative Inflation | Individual premium | Investment return | Utilization |
| 2007 | 2.00% | 9,00% | 25,21% | 25,21% | 3,15% | 3,15% | 72,000 | 9,04% | 0,28 |
| 2008 | 2.00% | 9,00% | 28,38% | 28,38% | 3,15% | 3,15% | 100,000 | 9,04% | 0,37 |
| 2009 | 2.00% | 9,50% | 31,50% | 31,50% | 3,15% | 3,15% | 120,000 | 9,04% | 0,46 |
| 2010 | 2.00% | 9,50% | 34,65% | 34,65% | 3,15% | 3,15% | 150,000 | 9,04% | 0,55 |
| 2011 | 2.00% | 9,50% | 37,80% | 37,80% | 3,15% | 3,15% | 184,000 | 9,04% | 0,64 |
| 2012 | 2.00% | 9,50% | 40,94% | 40,94% | 3,15% | 3,15% | 184,000 | 9,04% | 0,73 |
| 2013 | 2.00% | 9,50% | 44,09% | 44,09% | 3,15% | 3,15% | 184,000 | 9,04% | 0,82 |
| 2014 | 2.00% | 9,00% | 47,23% | 47,23% | 3,15% | 3,15% | 184,000 | 9,04% | 0,91 |
| 2015 | 2.00% | 9,00% | 50,38% | 50,38% | 3,15% | 3,15% | 184,000 | 9,04% | 1,00 |
| 2016 | 2.00% | 9,00% | 53,52% | 53,52% | 3,15% | 3,15% | 184,000 | 9,04% | 1,09 |
| 2017 | 2.00% | 9,00% | 56,67% | 56,67% | 3,15% | 3,15% | 184,000 | 9,04% | 1,19 |
| 2018 | 2.00% | 9,00% | 59,81% | 59,81% | 3,15% | 3,15% | 184,000 | 9,04% | 1,28 |
| 2019 | 2.00% | 9,00% | 62,96% | 62,96% | 3,15% | 3,15% | 184,000 | 9,04% | 1,37 |
| 2020 | 2.00% | 9,00% | 66,10% | 66,10% | 3,15% | 3,15% | 184,000 | 9,04% | 1,46 |
| 2021 | 2.00% | 9,00% | 69,25% | 69,25% | 3,15% | 3,15% | 184,000 | 9,04% | 1,55 |
| 2022 | 2.00% | 9,00% | 72,39% | 72,39% | 3,15% | 3,15% | 184,000 | 9,04% | 1,64 |
| 2023 | 2.00% | 9,00% | 75,54% | 75,54% | 3,15% | 3,15% | 184,000 | 9,04% | 1,73 |
| 2024 | 2.00% | 9,00% | 78,68% | 78,68% | 3,15% | 3,15% | 184,000 | 9,04% | 1,82 |
| 2025 | 2.00% | 9,00% | 78,88% | 78,88% | 3,15% | 3,15% | 184,000 | 9,04% | 1,91 |
| 2026 | 2.00% | 9,00% | 78,88% | 78,88% | 3,15% | 3,15% | 184,000 | 9,04% | 2,00 |
| Utilization ratio (Referred Outpatient Care / Primary Outpatient Care) | | | | | | | 0.07 | | |
| Utilization ratio (Referred Inpatient Care / Primary Outpatient Care) | | | | | | | 0.01 | | |

Figure 12: Past Data Page of the Report

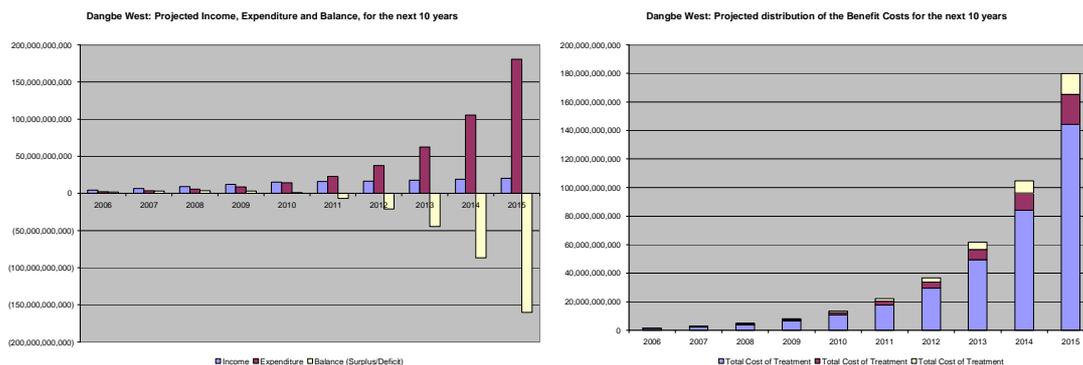
| PAST DATA FOR THE DISTRICT OF ADANS NORTH | |
|---|---------|
| Year | 2008 |
| Population | 110,000 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 120,000 |
| Investment return | 9,04% |
| Utilization | 0,46 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 150,000 |
| Investment return | 9,04% |
| Utilization | 0,55 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 0,64 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 0,73 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 0,82 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 0,91 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,00 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,09 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,19 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,28 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,37 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,46 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,55 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,64 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,73 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,82 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 1,91 |
| Medical Inflation | 3,15% |
| Administrative Inflation | 3,15% |
| Individual premium | 184,000 |
| Investment return | 9,04% |
| Utilization | 2,00 |

Figure 13: Result Page of the Report

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|--|-------------|-------------|-------------|---------------|---------------|---------------|---------------|---------------|----------------|
| BUDGET PROJECTION FOR THE DISTRICT OF ADJANGA NORTH | | | | | | | | | |
| POPULATION DATA | | | | | | | | | |
| Total Population | 102 | 106 | 109 | 112 | 115 | 118 | 121 | 124 | 127 |
| Female Population | 54 | 56 | 57 | 58 | 60 | 61 | 62 | 63 | 64 |
| Male Population | 48 | 50 | 52 | 54 | 55 | 57 | 59 | 61 | 63 |
| Urban Population | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| Rural Population | 77 | 80 | 82 | 84 | 86 | 88 | 90 | 92 | 94 |
| Urban % | 24.5% | 23.5% | 24.7% | 25.9% | 27.0% | 28.8% | 30.6% | 32.3% | 34.3% |
| Rural % | 75.5% | 76.5% | 75.3% | 74.1% | 73.0% | 71.2% | 69.4% | 67.7% | 65.7% |
| COVERAGE DATA | | | | | | | | | |
| Total Benefit Cost | 220,556,624 | 413,270,627 | 719,819,753 | 1,027,738,662 | 1,748,197,054 | 2,921,182,624 | 4,618,977,258 | 6,271,432,713 | 13,488,168,464 |
| COVERAGE COST | | | | | | | | | |
| Total Cost of Treatment | 638 | 1,121 | 1,887 | 3,100 | 5,099 | 8,332 | 13,983 | 23,281 | 38,887 |
| Number of Patients | 23 | 38 | 52 | 82 | 14 | 30 | 123 | 112 | 128 |
| Per Treatment Cost (per patient) | 27 | 29 | 37 | 38 | 36 | 26 | 113 | 208 | 302 |
| PHYSICIAN COST | | | | | | | | | |
| Total Cost of Treatment | 1,664 | 3,012 | 5,291 | 7,111 | 12,248 | 20,715 | 34,822 | 58,994 | 99,128 |
| Number of Patients | 2 | 2 | 4 | 4 | 5 | 5 | 7 | 8 | 9 |
| Per Treatment Cost (per patient) | 792 | 1,506 | 1,300 | 1,778 | 2,450 | 3,452 | 4,975 | 7,224 | 11,014 |
| PHARMACEUTICALS COST | | | | | | | | | |
| Total Cost of Treatment | 0 | 0 | 79 | 107 | 147 | 209 | 299 | 402 | 561 |
| Number of Patients | 0 | 0 | 73 | 107 | 147 | 207 | 298 | 402 | 561 |
| Per Treatment Cost (per patient) | 0 | 0 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Administration Cost | 2 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 |
| Per Patient | 42 | 71 | 116 | 182 | 264 | 371 | 506 | 678 | 918 |
| Gross Premium | 12,000 | 100,000 | 128,000 | 186,000 | 184,000 | 184,000 | 184,000 | 184,000 | 184,000 |
| Profit Margin | (7,500) | (9,000) | (12,500) | (18,000) | (18,000) | (18,000) | (18,000) | (18,000) | (18,000) |
| Income and Expenditure Statement | | | | | | | | | |
| Insurance Premiums | 4,924,441 | 6,268,448 | 9,462,480 | 15,179,821 | 17,293,058 | 26,142,315 | 33,146,239 | 38,416,206 | 29,975,863 |
| Subsidy from Govt | 1,872,000 | 2,000,000 | 4,932,000 | 4,209,000 | 7,812,000 | 8,812,000 | 9,762,000 | 10,888,000 | 11,776,000 |
| Subsidy from Donor | 1,844,000 | 2,000,000 | 3,528,000 | 4,424,000 | 6,300,000 | 9,794,000 | 9,888,000 | 9,888,000 | 6,207,000 |
| Administrative Support | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Other Income | 67,848 | 148,718 | 202,487 | 272,000 | 344,410 | 272,718 | 401,226 | 429,333 | 487,841 |
| Sub Total | 2,813,908 | 5,449,166 | 18,128,486 | 19,890,211 | 13,779,478 | 14,660,233 | 16,241,235 | 17,151,249 | 18,206,614 |
| Investment Income | 112,708 | 631,830 | 1,322,182 | 2,289,810 | 3,617,258 | 5,217,258 | 7,126,261 | 8,241,980 | 11,676,000 |
| Expenses | 2,226 | 4,118 | 7,207 | 17,484 | 24,274 | 34,274 | 48,118 | 62,218 | 128,448 |
| Benefit Expenses | 2,226 | 4,118 | 7,207 | 17,484 | 24,274 | 34,274 | 48,118 | 62,218 | 128,448 |
| Operational Costs | 2,226 | 4,118 | 7,207 | 17,484 | 24,274 | 34,274 | 48,118 | 62,218 | 128,448 |
| Operational Expenses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Administrative Expenses | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subsidy from Govt | 4,882,248 | 6,278,168 | 9,490,480 | 15,162,710 | 17,274,110 | 26,119,058 | 33,138,239 | 38,404,206 | 29,959,863 |
| Reasons at the end of the year | 4,882,248 | 1,618,788 | 28,174,247 | 33,282,847 | 36,498,238 | 78,776,126 | 93,374,478 | 128,216,404 | 188,842,816 |
| Rate of Return (Interest) | 100.00% | 33.33% | 59.09% | 62.50% | 62.50% | 62.50% | 62.50% | 62.50% | 62.50% |
| Public Ratio | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

Two charts complete the report. The first one is the projected, income expenditure and balance in a Clustered Column Chart. The second is a stacked column graph, showing the contribution for each of the treatment types for the Total Benefit Cost.

Figure 14: Charts in the Report



8. Closing without generating the Report

The last button in the “Main Window”, “Close” gives the opportunity to the user to close the program without making a report. It also allows the user to save or not the changes done in the Historical Data, Assumptions or Results. Once the “Close” option has been selected, the user will be asked if he/she wants to save the changes. This is different to the case when the user prepares a report, in such a case the changes are always saved.

Formulae for Past Data page in Report

Formulae for Population

$$EP_t = I_t + C_t + E_t + SSNITC_t + SSNITP_t$$

$$UP_t = TP_t - CP_t - EP_t$$

$$CR_t = 1 - \frac{UP_t}{TP_t} = CP_t / TP_t$$

EP_t : Exempted Population

I_t : Indigent, coming from the field “Indigent” in the “Introduction of Historical Data” Window.

C_t : Children (under 18), coming from the field “Under 18” in the Introduction of Historical Data Window.

E_t : Elderly (70 and above) coming from the field “70 and above” in the Introduction of Historical Data Window.

$SSNITC_t$: SSNIT Contributors, coming from the field “SSNIT Contributors” in the Introduction of Historical Data Window These have been included under the exempted although they contribute with the payment of 2.5 percent of their salary but they do not pay the district schemes the premium.

$SSNITP_t$: SSNIT Pensioners, coming from the field “SSNIT Pensioners” in the Introduction of Historical Data Window.

TP_t : Total Population, coming from the field “Total” in the “Introduction of Historical Data” Window.

UP_t : Uncovered Population

CP_t : Covered Population, coming from the field “Covered” in the “Introduction of Historical Data” Window.

CR_t : Coverage Ratio

*All the values except Coverage Ratio are rounded to the nearest integer.

Formulae for Costs

$$TBC_t = POCTC_t + ROCTC_t + RICTC_t$$

$$POCAC_t = \frac{POCTC_t}{POCNC_t}$$

$$RP_t = \frac{TBC_t}{CP_t + EP_t}$$

$$ROCAC_t = \frac{ROCTC_t}{ROCNC_t}$$

$$GP_t = \frac{TBC_t + AC_t}{CP_t + EP_t}$$

$$RICAC_t = \frac{RICTC_t}{RICNC_t}$$

$$PG_t = GP_t - P_t$$

- TBC_t : Total Benefit Cost.
- $POCTC_t$: Total Cost of Primary Outpatient Care, coming from the field “Total Cost of Primary Care” in the “Introduction of Historical Data” window.
- $ROCTC_t$: Total Cost of Referred Outpatient Care, coming from the field “Total Cost of Outpatient Care for Referral Cases” in the “Introduction of Historical Data” window.
- $RICTC_t$: Total Cost of Referred Inpatient Care, coming from the field “Total Cost of Inpatient Care for Referral Cases” in the “Introduction of Historical Data” window.
- $POCAC_t$: Average Cost per Contact of Primary Outpatient Care.
- $POCNC_t$: Number of contacts in Primary Outpatient Care, coming from the first field “Number of Contacts” in the “Introduction of Historical Data” window.
- $ROCAC_t$: Average Cost per Contact of Referred Outpatient Care.
- $ROCNC_t$: Number of contacts in Referred Outpatient Care, coming from the second field “Number of Contacts” in the “Introduction of Historical Data” window.
- $RICAC_t$: Average Cost per Admission of Referred Inpatient Care.
- $RICNC_t$: Number of contacts in Referred Inpatient Care, coming from the field “Number of Admissions” in the “Introduction of Historical Data” window.
- RP_t : Risk Premium
- CP_t : Covered Population, coming from the field “Covered” in the “Introduction of Historical Data” Window.
- EP_t : Exempted Population
- GP_t : Gross Premium
- AC_t : Administrative Cost, coming from the field “Administrative Cost” in the “Introduction of Historical Data” Window.
- PG_t : Premium Gap
- P_t : Individual Premium, coming from the field “Premium” in the “Introduction of Historical Data” Window

Formulae for Income and Expenditure Statement

$$ST_t = IP_t + NHISSub_t + AdmSupport_t + Other_t$$

$$Exp_t = TBC_t + AC_t$$

$$InvInc_t = \begin{cases} R_{t-1} \cdot r_t + (ST_t - Exp_t) \left((1 + r_t)^{\frac{1}{2}} - 1 \right) & \text{if } R_{t-1} + ST_t - Exp_t > 0 \\ 0 & \text{if } R_{t-1} + ST_t - Exp_t \leq 0 \end{cases}$$

$$Inc_t = ST_t + InvInc_t$$

$$Bal_t = Inc_t - Exp_t$$

$$R_t = R_{t-1} + Bal_t$$

$$FR_t = \frac{R_t}{Exp_t}$$

ST_t : Sub Total

IP_t : Insurance Premiums Income, coming from the field “Insurance Premium” in the “Introduction of Historical Data” window.

$NHISSub_t$: Subsidies from the NHIS, coming from the field “Subsidies from NHIS” in the “Introduction of Historical Data” window

$AdmSupport_t$: Administrative Support from NHIS, coming from the field “Administrative Support” in the “Introduction of Historical Data” window

$Other_t$: Other income, coming from the field “Other Income” in the “Introduction of Historical Data” window

Exp_t : Total Expenditure.

TBC_t : Total Benefit Cost

AC_t : Administrative Cost, coming from the field “Administrative Cost” in the “Introduction of Historical Data” Window.

$InvInc_t$: Investment Income

R_t : Reserves a time t.

r_t : Rate of Return over Investments, coming from the field “Investment Return” in the “Introduction of Historical Data” window

Inc_t : Total Income

Bal_t : Balance

FR_t : Fund Ratio.

Formulae for Results Page in Report

Formulae for Population

$$TP_{t+i} = TP_{t+i-1} \cdot (1 + \Delta P_{t+i})$$

$$CP_{t+i} = TP_{t+i} \cdot PCP_{t+i}$$

$$EP_{t+i} = TP_{t+i} \cdot PEP_{t+i}$$

$$UP_{t+i} = TP_{t+i} - CP_{t+i} - EP_{t+i}$$

- TP_{t+i} : Total Population
- ΔP_{t+i} : Percent change in the Total Population, coming from Assumptions
- PEP_{t+i} : Percentage of Exempted Population, coming from Assumptions.
- PCP_{t+i} : Percentage of Contributive Population, coming from assumptions
- EP_{t+i} : Exempted Population
- UP_{t+i} : Uncovered Population.
- CP_{t+i} : Covered Population.
- *All the results of the formulas except Coverage Ratio are rounded to the nearest integer.
- **Whenever the subscript of a variable is equal or inferior to t, the value is taken from historical data.

Formulae for Costs

$$U_{t+i} = \begin{cases} \left(\frac{U_{t+k} - U_t}{k} \right) \cdot i + U_t & \text{if } i < k \\ U_{t+k} & \text{if } i \geq k \end{cases}$$

$$POCAC_{t+i} = POCAC_{t+i-1} \cdot (1 + MedInf_{t+i}) \quad POCNC_{t+i} = (CP_{t+i} + EP_{t+i}) \cdot U_{t+i}$$

$$POCTC_{t+i} = POCAC_{t+i} \cdot POCNC_{t+i}$$

$$ROCAC_{t+i} = ROCAC_{t+i-1} \cdot (1 + MedInf_{t+i})$$

$$ROCNC_{t+i} = (CP_{t+i} + EP_{t+i}) \cdot U_{t+i} \cdot RatioUROC \quad ROCTC_{t+i} = ROCAC_{t+i} \cdot ROCNC_{t+i}$$

$$RICAC_{t+i} = RICAC_{t+i-1} \cdot (1 + MedInf_{t+i})$$

$$RICNC_{t+i} = (CP_{t+i} + EP_{t+i}) \cdot U_{t+i} \cdot RatioURIC \quad RICTC_{t+i} = RICAC_{t+i} \cdot RICNC_{t+i}$$

$$TBC_t = POCTC_t + ROCTC_t + RICTC_t$$

$$AC_{t+i} = AC_{t+i-1} (1 + AdmInf_{t+i})$$

$$RP_{t+i} = \frac{TBC_{t+i}}{CP_{t+i} + EP_{t+i}}$$

$$GP_{t+i} = \frac{TBC_{t+i} + AC_{t+i}}{CP_{t+i} + EP_{t+i}}$$

$$PG_{t+i} = GP_{t+i} - P_{t+i}$$

| | |
|------------------|--|
| U_{t+i} : | Utilization of Primary Outpatient care, number of consults per covered person |
| U_{t+k} : | Target Utilization of Primary Outpatient Care, coming from assumptions |
| $t+k$: | Year wanted to achieve the target utilization, coming from assumptions |
| $POCAC_{t+i}$: | Average Cost per Contact of Primary Outpatient Care. |
| $MedInf_{t+i}$: | Medical Inflation, coming from assumptions. |
| $POCNC_{t+i}$: | Number of contacts in Primary Outpatient Care, the value is rounded to the nearest integer. |
| $POCTC_{t+i}$: | Total Cost of Primary Outpatient Care |
| $ROCAC_{t+i}$: | Average Cost per Contact of Referred Outpatient Care. |
| $ROCNC_{t+i}$: | Number of contacts in Referred Outpatient Care, the value is rounded to the nearest integer. |
| $RatioUROC$: | Ratio of utilization of Referred Outpatient Care to Utilization of Primary Outpatient Care, coming from Assumptions and constant during all the projection period. |
| $ROCTC_{t+i}$: | Total Cost of Referred Outpatient Care |
| $RICAC_{t+i}$: | Average Cost per Contact of Referred Inpatient Care. |
| $RICNC_{t+i}$: | Number of contacts in Referred Inpatient Care, the value is rounded to the nearest integer. |
| $RatioURIC$: | Ratio of utilization of Referred Inpatient Care to Utilization of Primary Outpatient Care, coming from Assumptions and constant during all the projection period. |
| $RICTC_{t+i}$: | Total Cost of Referred Inpatient Care |
| TBC_{t+i} : | Total Benefit Cost. |
| AC_{t+i} : | Administrative Cost. |
| $AdmInf_{t+i}$: | Administrative Inflation, coming from assumptions |
| RP_{t+i} : | Risk Premium |
| EP_{t+i} : | Exempted Population |
| CP_{t+i} : | Covered Population. |
| GP_{t+i} : | Gross Premium |
| PG_{t+i} : | Premium Gap |
| P_{t+i} : | Individual Premium, coming from Assumptions |

*Whenever the subscript of a variable is equal or inferior to t, the value is taken from historical data.

Formulae for Income and Expenditure Statement

$$\begin{aligned}
 IP_{t+i} &= CP_{t+i} \cdot P_{t+i} \\
 NHISSub_{t+i} &= EP_{t+i} \cdot P_{t+i} \\
 AdmSupport_{t+i} &= AdmSupport_{t+i-1} \cdot (1 + AdmInf_{t+i}) \\
 Other_{t+i} &= \frac{(IP_{t+i} + NHISSub_{t+i} + AdmSupport_{t+i}) \cdot 0.025}{0.975} \\
 ST_{t+i} &= IP_{t+i} + NHISSub_{t+i} + AdmSupport_{t+i} + Other_{t+i} \\
 Exp_{t+i} &= TBC_{t+i} + AC_{t+i} \\
 InvInc_{t+i} &= \begin{cases} R_{t+i-1} \cdot r_{t+i} + (ST_{t+i} - Exp_{t+i}) \left((1 + r_{t+i})^{\frac{1}{2}} - 1 \right) & \text{if } R_{t+i-1} + ST_{t+i} - Exp_{t+i} > 0 \\ 0 & \text{if } R_{t+i-1} + ST_{t+i} - Exp_{t+i} \leq 0 \end{cases} \\
 Inc_{t+i} &= ST_{t+i} + InvInc_{t+i} \\
 Bal_{t+i} &= Inc_{t+i} - Exp_{t+i} \\
 R_{t+i} &= R_{t+i-1} + Bal_{t+i} \\
 FR_{t+i} &= \frac{R_{t+i}}{Exp_{t+i}}
 \end{aligned}$$

- IP_{t+i} : Insurance Premiums Income
 CP_{t+i} : Covered Population.
 P_{t+i} : Individual Premium, coming from Assumptions
 $NHISSub_{t+i}$: Subsidies from the NHIS
 EP_{t+i} : Exempted Population
 $AdmSupport_{t+i}$: Administrative Support from NHIS
 $AdmInf_{t+i}$: Administrative Inflation, coming from assumptions
 $Other_{t+i}$: Other income
 ST_{t+i} : Sub Total
 Exp_{t+i} : Total Expenditure.
 TBC_{t+i} : Total Benefit Cost
 AC_{t+i} : Administrative Cost
 $InvInc_{t+i}$: Investment Income
 R_{t+i} : Reserves a time t+i.
 r_{t+i} : Rate of Return over Investments, coming from Assumptions
 Inc_{t+i} : Total Income
 Bal_{t+i} : Balance
 FR_{t+i} : Fund Ratio.

*Whenever the subscript of a variable is equal or inferior to t, the value is taken from historical data.

Definitions

Primary care is the care provided by physicians specifically trained for and skilled in comprehensive first contact and continuing care for persons with any undiagnosed sign, symptom, or health concern (the "undifferentiated" patient) not limited by problem origin (biological, behavioral, or social), organ system, or diagnosis. It includes health promotion, disease prevention, health maintenance, counseling, patient education, diagnosis and treatment of acute and chronic illnesses in a variety of health care settings (e.g., office, inpatient, critical care, long-term care, home care, day care, etc.).

Referred care is the care provided by (specialist) physicians specifically trained for and skilled in comprehensive contact and continuing care for persons with a diagnosed sign, symptom, or health concern identified in the primary care phase. The referred care is limited by problem origin (biological, behavioral, or social), organ system, or diagnosis. It includes diagnosis and treatment of acute and chronic illnesses in a variety of health care settings.

Outpatient care: Medical and other services provide by a hospital or other facility (e.g. mental health clinic, rural health clinic, mobile clinic or X-ray unit) to patients who do not need overnight stay in the health facility.

Inpatient care: Diagnostic, analytical or therapeutical services provided to any person that requires at least an overnight stay in the health facility. The services are usually divided into accommodation (room and board), medical and surgical services, and ancillary or technical services.

Coverage ratio: The ratio of the number of insured persons actually insured/registered/covered by the scheme to the potential number of persons that should be covered which often refers to the number of employed persons in the population or some of its sub-groups.

Risk premium: The premium to be paid for each covered individual in order to finance the costs of health services in the present period.

Gross premium: The premium to be paid for each covered individual in order to finance the costs of health services and the administrative expenses in the present period.

Premium Gap: The difference between the Gross Premium and the Actual Premium. If it is positive it represents the amount of money needed to increase the premium in order to pay the costs of health services and the administrative expenses. If it is negative it represents an excess of premium paid by the existing contributors which can be placed in reserves to finance future benefits.

Fund Ratio: The Funding Ratio estimates the number of times (in years) the reserve fund at the end of a particular year can meet all the projected annual expenditure in the ensuing year. This measure could be interpreted as an approximation of the number of years (or fractions of years) the health care system could continue working in the hypothetical case where the system stops receiving contributions.

Administrative Support: Costs related to the operations of the health care system, including such items as risk management, utilization review, premium collection, claims processing, quality assurance and underwriting fees. All the money transfers received from NHIS with the explicit objective of financing the administrative expenses of the District Health Care Provider.

Sources:

Cichon, M.; Newbrander, W.; Yambana, H.; Weber, A.; Normand, C.; Dror, D.; Preker, A. (1999): *Modelling in health care finance: A compendium of quantitative techniques for health care financing* . Quantitative methods in social protection series (Geneva, ILO/ISSA).