# DEALING WITH THE CHALLENGE OF SUSTAINABILITY: ANALYSIS OF COST AND EFFICIENCY OF HEALTH CARE IN 4 HOSPITALS IN NORTHERN UGANDA

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## Introduction

The sustainability of health care delivery has become a critical issue worldwide. This is even truer for Sub-saharan Africa, where the gap between demand and resources available for the financing of health care is extremely wide.
A group of Private Not-for-profit (PNFP) Hospitals located in Northern Uganda has managed to provide services of acceptable quality standards in an area affected by social unrest in an economic environment not conducive for the sustained provision of health care at accessible costs.
Cost analysis in Hospitals have been carried out as point in time exercises both in Uganda and in other Countries of Sub-saharan Africa, but the format of most studies carried out did not allow the identification of trends.
This study aims at providing a trend analysis without recourse to extensive, labor intensive and expensive exercises, accepting the challenge of sustainability also in the field of operational research.
The questions this presentation tries to answer are the following:

- which patterns can be identified by examining activity and financial trends?
- what kind of interpretation could these patterns be subjected to?
- is there any lesson or "caveat" to be drawn from this interpretation?

## Material and methods

Data were collected from 4 Hospitals (Kalongo, Kitgum St Joseph, Lacor, Matany) for key parameters. All the parameters observed could be obtained from the information system maintained in each hospital and did not require specific research.
Activity parameters were obtained from the standard Information System (HIS) introduced in these hospitals in the late '80ties in the frame of the collaboration between the Health Planning Unit of the Ministry of Health and the Italian Cooperation in Northern Uganda. In two of the 4 Hospitals the original database provided by the Ministry was still fully utilized and updated. Financial data were obtained form the Annual Reports of the respective hospitals.
It was possible to obtain comparative data for the following information:

- n. of in patients
- n. of outpatient contacts
- total income
- income from fees
- income from delegated funds
- total expenditure

- expenditure for salaries.

A consistent information was available for a period of 5 years from 1994 to 1998. Each hospital provided the information requested.
All financial data were converted to US$ values at the mid-year exchange rate for each year. Other data expected to be collected (n. of in-patient days, activity indicators for PHC, more specific financial information) were not available in all hospitals examined under the same format and/or for the entire period covered.
Data entry and analysis was carried out on a standard program MS Excel for Office 97.
All data are presented and analyzed as cumulative data. The obvious limitation of this approach is justified by the purpose of the study. Each hospital has received a specific analysis feed back. No major discrepancies of trend were observed in the 4 Hospitals studied.
The following indicators were utilized:

- In patient (IP) equivalent[a] (IPEq)
- Out patient (OP) equivalent
- Overall Cost for IP equivalent
- Overall Cost for OP equivalent
- Salary cost per IP equivalent
- Non salary cost per IP equivalent
- Income form user fees per IP equivalent

## Results

The results of the study are presented in the following order:

- Descriptive data
- Trends of cumulative expenditure data
- Trends of cumulative income data
- Trends of cumulative activity data
- Analytic data
- Trends of costs (overall, salary, non salary) per IP Equivalent
- Trends of income (overall, fees) per IP Equivalent.

Cumulative expenditure (Table 1)

- ✓ The total expenditure (cost of service production) increased from 1.77 M US$ to 2.3 M (+30%)
- ✓ The expenditure for Salaries showed a sharp increase over the period from 0.4 M US$ to 0.95 M US$ (+130%)
- ✓ The Non-salary expenditure showed a mild decrease from 1.38 M US$ to 1.33 US$ (-3%).

[a] The IP Equivalent is a composite indicator that takes account of both IP and OP, by attributing a relative weight to OP. The conversion rate constant is drawn from the comparison between the financial cost of 1 IP admission and 1 OP contact, established in a previous cost analysis carried out by the author. 1 IP admission has an average cost 15 times higher than that of an OP contact. Other authors utilize different conversion rates. For the purpose of this study the stated assumption was considered adequate. Therefore the formula utilized to calculate the number of IP Equivalents is the following:
1 IP Eq. = (n. IP + n. OP/15)

The relative proportion of cost of salary went from 22% of the total to 41% of the total in 5 years, with a remarkably steady growth.

***Graphic 1***

CUMULATIVE EXPENDITURE (M US$)

| Parameter | Beginning | End | % |
|---|---|---|---|
| | | | |
| Total Expenditure | 1.77 | 2.3 | + 30% |
| Expenditure for Salaries | 0.4 | 0.95 | + 130% |
| Non-salary expenditure | 1.38 | 1.33 | - 3% |

Table 1

Cumulative Income (Table 2).

- ✓ The total Income went from 1.86 M US$ to 2.34 M US$ (+26%)
- ✓ Income from user fees paid by patients went from 0.3 M US$ to 0.4 M US$ (+25%)
- ✓ No income from Delegated Funds (DF - earmarked funds channeled from Central Government Budget through the District Administration) is recorded before 1997. In 1998 the income from DF accounts for 0.14 M US$.

The relative proportion of income from fees versus the total remained virtually unchanged (16 to 17% of the total).

The income from DF accounts, at the end of the period observed, for 6% of the income of that year.

***Graphic 2***

CUMULATIVE INCOME (M US$)

| Parameter | Beginning | End | % |
|---|---|---|---|
| | | | |
| Total Income | 1.86 | 2.34 | + 26% |
| Income from user fees | 0.3 | 0.4 | + 25% |
| Delegated Funds | 0 | 0.14 | |

Table 2

Cumulative Activity (Table 3)

- ✓ Cumulative outpatient workload: OP contacts went from 240,000 to 222,000 (-7.5%)
- ✓ Cumulative inpatient workload: IPs went from 30,000 to 38,000 (+ 27%)

The number of IPEq calculated increased from 45,000 to 52,000 (+15%).

***Graphic 3***

CUMULATIVE ACTIVITY

| Parameter | Beginning | End | % |
|---|---|---|---|
| | | | |
| OP | 240,000 | 222,000 | - 7.5% |
| IP | 30,000 | 38,000 | + 27% |
| IP Eq. | 45,000 | 52,000 | + 15% |

Table 3

Analytic data (Table 4).

- ✓ The overall cost per IPEq increased from 39.5 to 44.5 US $ (+12.6%)
- ✓ Salary cost per IPEq grew from 9 to 19 US$ (+ 111%)
- ✓ Non salary cost per IPEq decreased form 30.5 to 26 US$ (-15%)
- ✓ Overall income per IPEq increased almost parallel to cost from 41 to 45 US$ (+ 9.7%)
- ✓ Income from fees increased form 6.8 to 7.9 US $ (+ 17%).

***Graphics 4 to 6***

ANALYTIC DATA (US$)

| Parameter | Beginning | End | % |
|---|---|---|---|
| | | | |
| Tot. Expenditure/IPEq | 39.5 | 44.5 | + 12.6% |
| Salary cost/IPEq | 9 | 19 | + 111% |
| Non Salary cost /IPEq | 30.5 | 26 | - 15% |
| Total Income/IPEq | 41 | 45 | + 9.7% |
| Fees/IPEq | 6.8 | 7.9 | + 17% |

Table 4

## Discussion

Keeping in mind the objectives of the study the following considerations can be drawn.

*Patterns identified examining activity and financial trends and their interpretation.*

**Expenditure**: it is clear that the cost of service production, even when expressed in constant terms (US$), is increasing ***(Gr.1).*** This appears evident from the increase of 30% of total expenditure over the span of 5 years. An interesting observation is that the only cause of this increase is the cost of labor , with a remarkable +130%. In fact non salary costs show a clear decrease over the period. It would be interesting to assess the number and the composition of staff in order to explain the datum[b]. On the other hand all Hospitals reported that they had to increase the levels of salary as a

[b] In a study carried out in 1998 PNFP Hospitals had a qualified staff/bed ratio of 1.2 against 2.7 in Government Hospitals *(Mark Pearson, Analysis of Questionnaires of PNFP Hospitals, MoH Health Planning Department, 1998)*. This would suggest that staffing levels are not the cause of the increased cost of salary in the PNFP health sector.

consequence of the increases registered in the public health sector. It seems therefore that the main cause of the increase d cost of salary is the policy set by Government and the need to maintain comparable salary levels in the non-profit sector vis-a-vis those of civil servants[c]. A further study should also be made to explain the reduction of non-salary cost, to assess whether this is due to a more efficient use of resources or to a reduction in supplies and maintenance which would in the end erode the quality of service provided and the viability of the structures.

**Income**: when considering income ***(Gr.2)***, it appears clear that total income has grown steadily to match expenditure. On the other hand the trends observed in the two parameters "total income" and "income from fees" tend to diverge, showing a widening gap. The similar relative increases of 26 and 25% respectively are on a different order of magnitude, quite widely apart. The proportion of income from fees on the total has not increased. The funding gap (covered so far with a mix of other income - most likely donations from abroad, donations in kind, income generating activities and, of late, government subsidies in the form of DF) has widened. The proportion of income covered by government subsidies is ranging, at the end of the period, around 6%. These data suggest that the financial viability of the institutions studied is worsening, but also suggest that the worsened viability is mainly due to external factors (increased cost of salary). Further studies are necessary to determine the quota of "other income" that can be generated locally and that related to external aid, arguably non-sustainable. It is interesting to note anyway that all the institutions have made efforts to avoid downloading the increase of the cost of service provision on patients, thus confirming that they operate in the pursuit of equitable access to health care. It is altogether useful to recall here that the entire budget for health of Government is financially non sustainable, composed as it is of equal proportion of locally generated resources and external funds. Judging the sustainability of isolated elements of the health systems in mere financial terms would be contradictory of the fact that the entire health system in Uganda is financially non-sustainable. An efficient use of resources and an improved productivity are better indicators of sustainabiltity in the present context than mere financial considerations.

**Activity**: Overall productivity of service has increased ***(Gr. 3)***. Though OP, have decreased by 7.5%, IP have increased by 27% over the same period. The composite indicator of IPEq shows a slow but steady increase of 15 % over the span of 5 years. The slopes of comparative scales of expenditure and IPEq are almost perfectly matching ***(Gr.7),*** meaning that levels of efficiency have not decreased. This datum is all the more meaningful if one considers the environment in which these hospitals are operating, characterized by social unrest and insecurity, and clearly portrayed by the lowest HDI in the Country. A rather interesting datum is the opposite trend observed for OP and IP.

[c] An un-published study carried out by the author on 13 PNFP Hospitals showed that during FY 1997/98 the total amount of DF releases covered only 50% of the increased cost of salary triggered by the introduction of Lunch Allowance for civil servants in the health sector.

More studies are needed to establish the reasons of this phenomenon. Some hypothesis can anyway be expressed, based on direct experience of the author. All non-profit hospitals have heavily relied on surpluses generated by the OP department to finance the much more costly IP activities. It is not excluded that any attempt at improving the financial performance of the OPD (through increase of fees) has resulted in less accessible services. Thus patients prefer to obtain treatment elsewhere, if ever. From data available it appears anyhow that this has not occurred in either the government or the non profit sector of first level[d] ***(Graphic 8)***. This leaves open the question of whether patients are seen in the private for-profit sector and/or simply fail to obtain any kind of formal health care. Morbidity studies done in two of the hospitals for the same period and for IP[e], would suggest that a good proportion of the admissions are caused by diseases that could be easily treated as OP if detected and adequately managed at an early stage . The decreased utilization of OP services (both of Hospitals and of first contact units) could explain the fact that the number of admission has increased. If this hypothesis should prove true, then this datum raises a sure concern for the deteriorating access to care of first level, and raises a second concern for the concentration of complicated cases in the examined hospitals. An increasingly un-favorable case-mix would certainly have a bearing on the sustainability of the institutions concerned.

*Lessons and "caveat" drawn from the study.*

1. The first lesson learnt is that with a relatively simple set of data managed in a simple way a lot of information can be drawn. The effort made in the past years by the collaboration between the Health Planning Department, the Italian Cooperation and the institutions concerned has made these data available as routine information. Operational research is indeed possible with simple tools, manageable without recourse to expert advice.

2. The second lesson learnt is that sustainabilty must be judged in a contextual environment. Gains in efficiency, up to a certain extent, can make up for dwindling resources. The fact that these hospitals have managed to operate and to improve productivity in a non-conducive environment is indeed a proof of sustainability. There exist a sustainability that cannot be translated in easily demonstrable terms, made up by "institutional culture", by careful management, by close monitoring of the evolution of events and continuous adjustments of financing mechanisms and activity priorities. A mere financial analysis would not reveal this aspect of sustainability.

3. The third lesson is that there is a limit to what efficiency gain can obtain in terms of sustainability. The costs of service production are often determined by factors that are beyond the control that individual institutions can exercise. In this sense a

[d] Data drawn from the 1997 Annual Report of Matany Hospital show that the decreased utilization of the Hospital outpatient was not accompanied by an increased utilization of first level health unit (government and NGO) in the same catchment area. *(Matany Hospital, 1997 Annual Report) - see Graphic 8.*

[e] Accorsi S, et al. Coping with the impact of the AIDS epidemic in Northern Uganda. Rapporti ISTISAN 98/18.

more careful look at the impact that government policies on salary have on non-government health institutions is certainly a concern that government must have. The widening gap between resources available and costs of service production is, in this analysis, clearly determined by the need of these institutions to match the increased salary levels of civil servants. An un-cautious policy making of government can cripple beyond recovery institutions that still provide a large quota of socially oriented health service in rural areas.

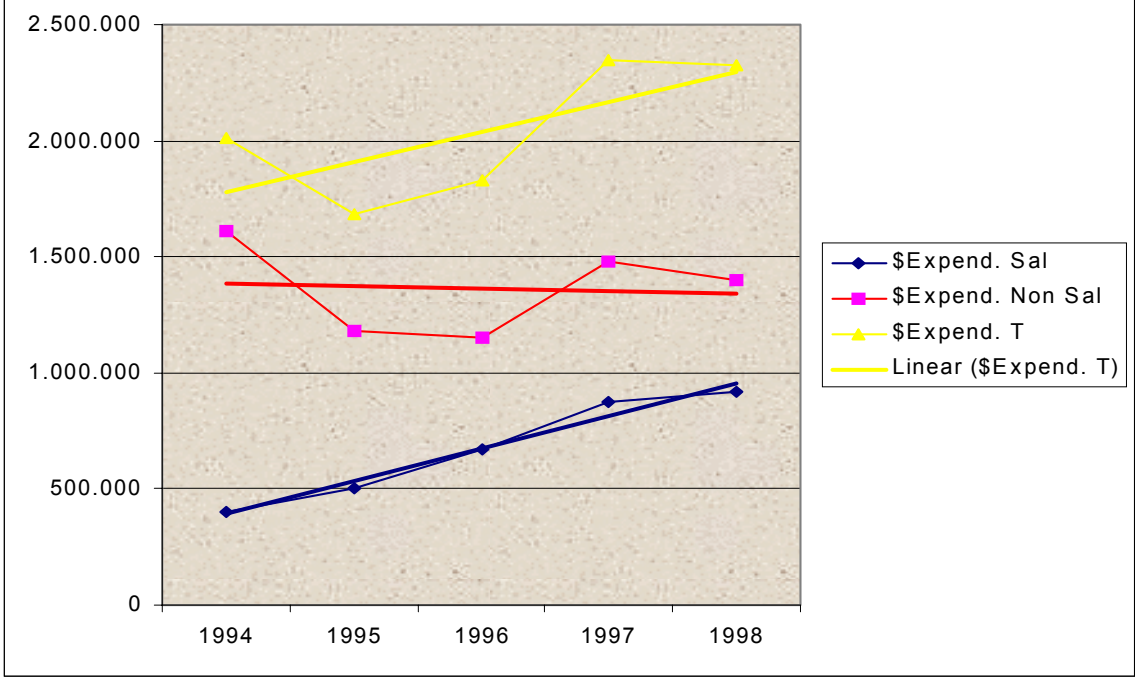
4. The fourth lesson is a caveat: if these institutions have managed to operate so far and to improve their productivity (and to document it), they are potentially sustainable. They represent an asset for the national health care system from which they should not be forced to part. The widening gap between costs and resources, which poses a threat to their future sustainability, is determined by factors that are external to the institutions themselves. A consistently sustained policy is needed to preserve these institutions as assets of the national health care system. This requires a continuous flow of communication between these institutions, policy makers and public administrators.

## Conclusion

The data analyzed in the institutions studied have given a rather clear picture of the challenge they have met and of the mechanisms used for coping with the challenge. It has also highlighted the fact that further challenges are appearing that need a more comprehensive approach, going well beyond the walls of the individual institutions. Sustainability, understood in its wider interpretation, has been possible so far and is still possible if the political and administrative environment make it possible.
The study opens up areas of further inquiry for the institutions concerned and, given its simplicity, is easily replicable elsewhere without the need of specific skills. Only seven parameters, easily obtainable in all hospitals, are necessary for the study. As model of analysis it constitutes a first, quick and dirty approach (nonetheless precious), to issues of cost and efficiency in health care delivery institutions.

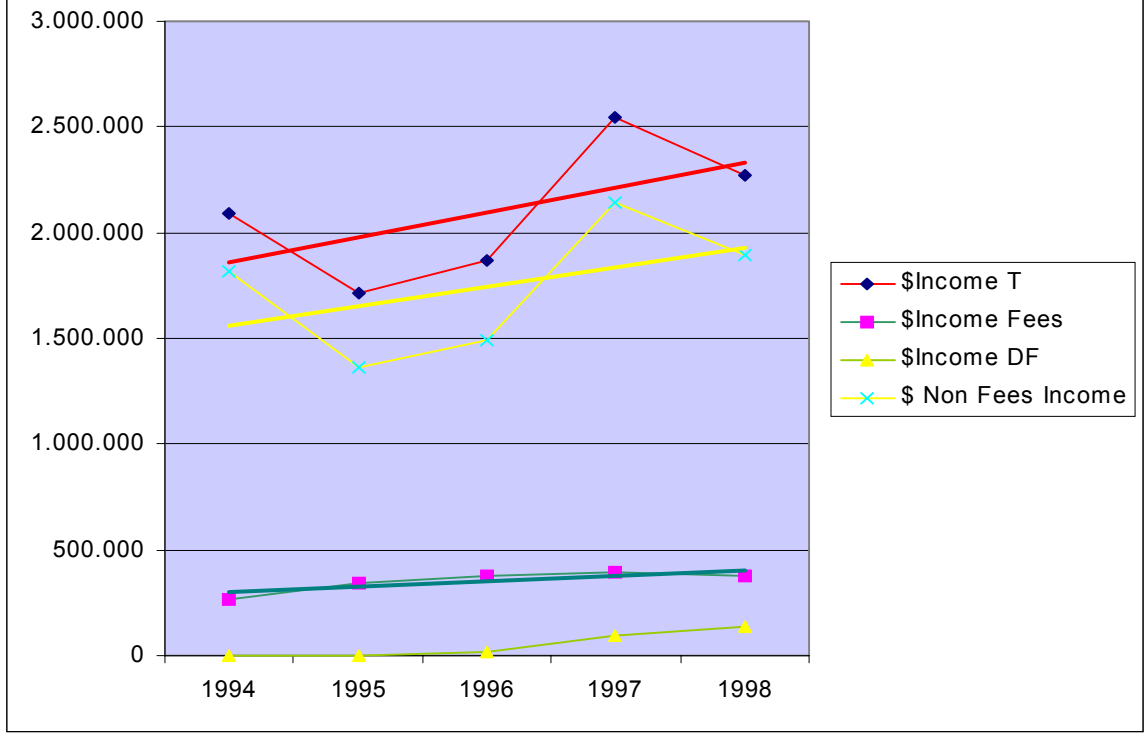
## Gr.1 - CUMULATIVE EXPENDITURE - US$ AND TRENDS

**Data of 4 Hospitals in Northern Uganda**



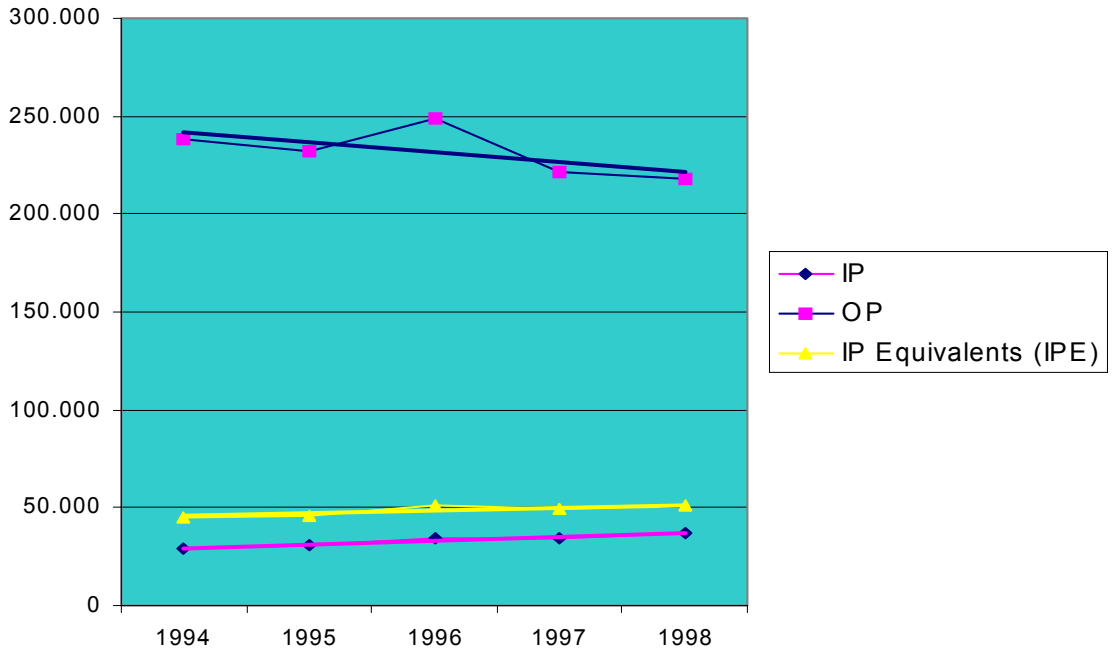

## Gr.2 - INCOME TRENDS - US$

**Cumulative data of 4 Hospitals in Northern Uganda**



## Gr.3 - ACTIVITY TRENDS

**Cumulative data of 4 Hospitals in Northern Uganda**

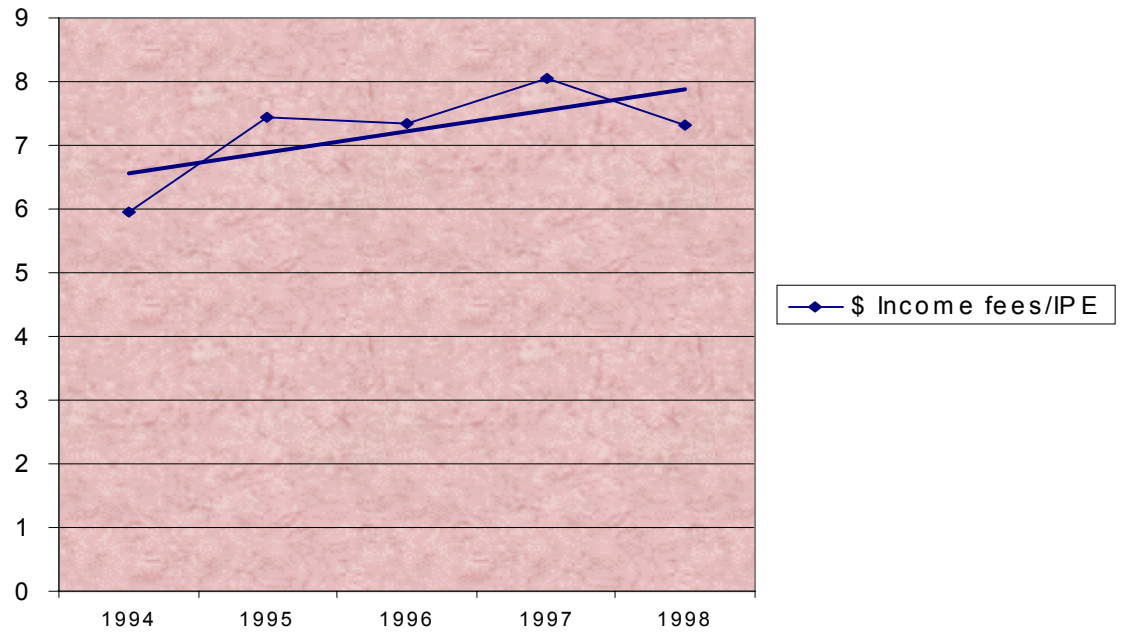



## Gr.5 - Overall cost per IP Equivalent - US$

Cumulative data of 4 Hospitals in Northern Uganda

## Gr.6 - Income from fees per IP equivalent - US$

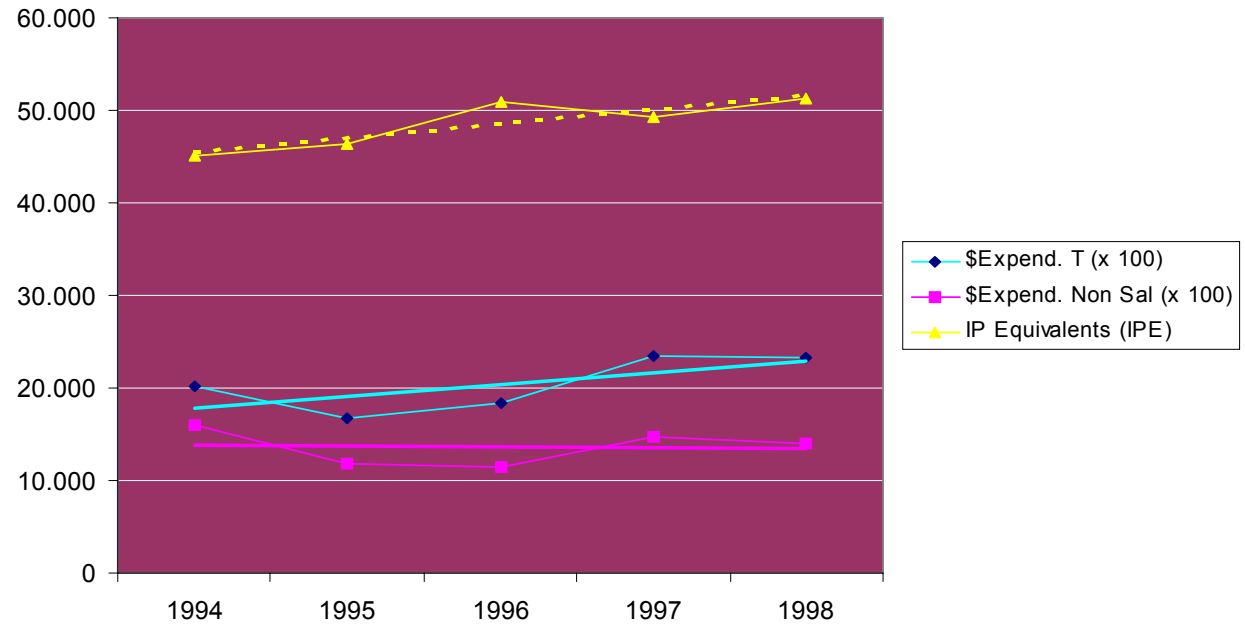
**Cumulative data of 4 Hospitals in Northern Uganda**



## Gr.7 - Evaluation of efficiency trends

Cumulative data in 4 Hospitals in Northern Uganda

(*Activity and financial data expressed on comparable scales)*

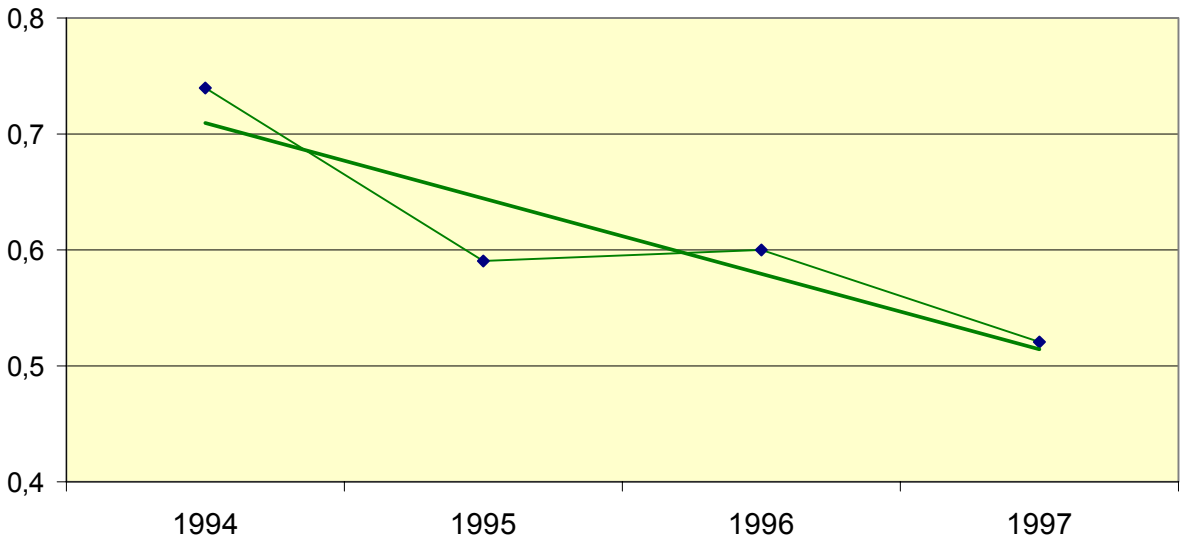


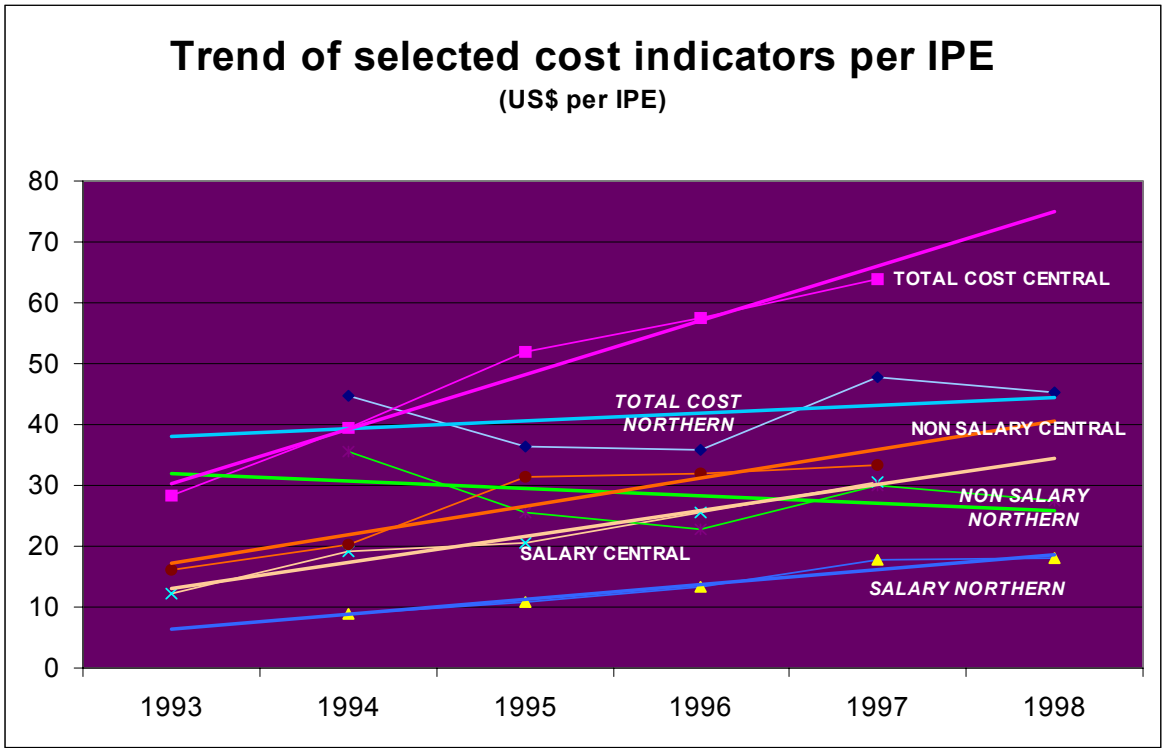

## Gr. 8 - OP UTILISATION RATES - BOKORA ZONE

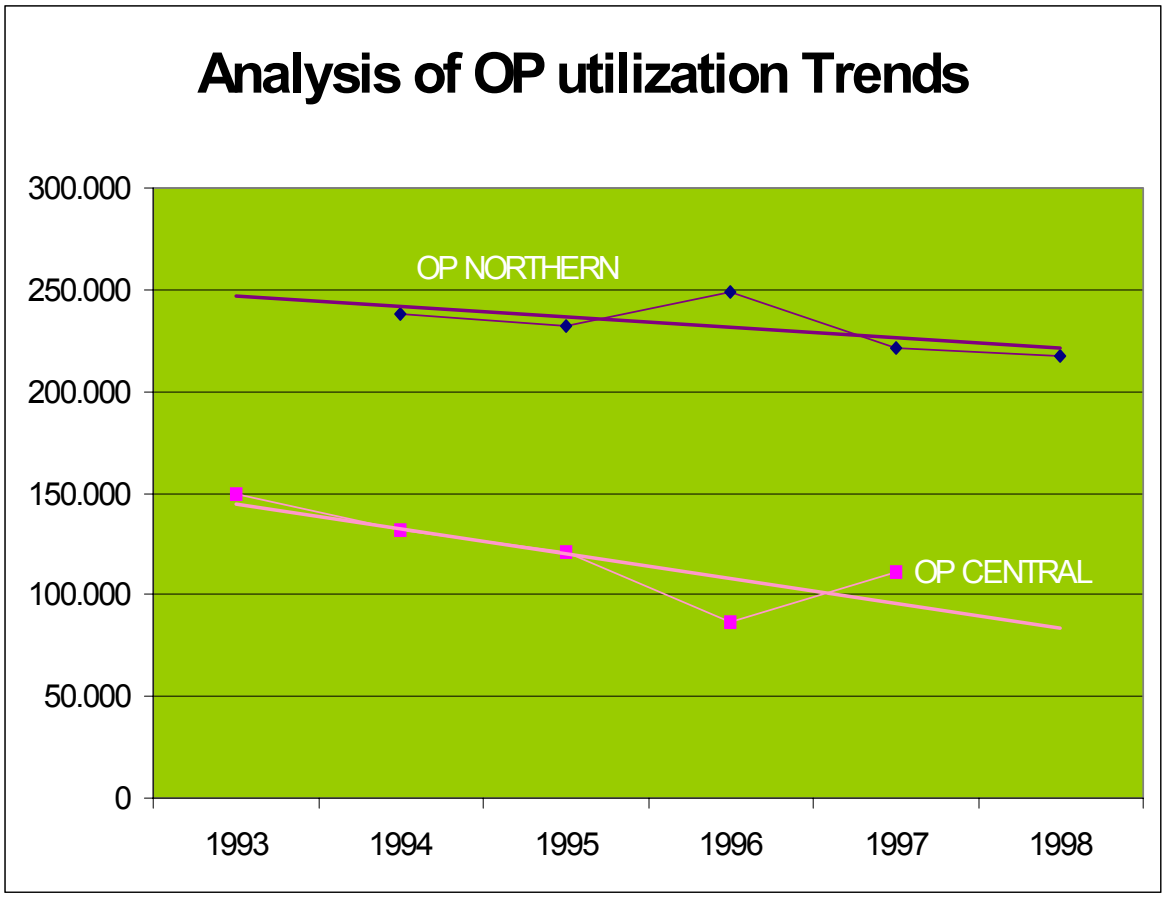
**(N. contacts-new per person per year)**

**Data form all Health Units - Government and NGOs - of the Zone**

***Data from Matany Hospital Public Health Department***




Trend of selected cost indicators per IPE
(US$ per IPE)
80
70
60
50
40
30
20
10
0
1993
1994
1995
1996
1997
1998
TOTAL COST CENTRAL
TOTAL COST NORTHERN
NON SALARY CENTRAL
NON SALARY NORTHERN
SALARY CENTRAL
SALARY NORTHERN


Analysis of OP utilization Trends
300.000
250.000
200.000
150.000
100.000
50.000
0
OP NORTHERN
OP CENTRAL
1993
1994
1995
1996
1997
1998