Analysis of costs and benefits of using computerized, and non-computerized, systems for health information management, Kampfumo District - Maputo City

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Abstract— This research seeks to answer the increasing availability of new technologies, the growing requirement of users in their relationship with public sector providers, and the issue of cost containment in health information systems. Based on processes and outcomes resources; the research provides important clues about the costs and benefits of using computerized and non - computerized system for the managing of Health Information in District of Kampfumo - Maputo City. It also seeks to answer four researcher personal concerns; the moral obligation (ethical), the investigative principle, pragmatism, promoting, disseminating, and encouraging the use of information system to able efficiently respond to the demand and minimize the costs involved in favor of benefits. The mixed method, qualitative exploratory and quantitative descriptive, was applied through a structured questionnaire. The evaluation of the technical, operational, and economic feasibility demonstrated in favor of adoption of computerized information, from the point of view of cost and benefits.
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Keywords: Costs, benefits, system, information, health, computer, non - computerized

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1 INTRODUCTION

This era of information and communication technologies, organizations are required to have efficient strategic information management resources, the which can be facilitated using intelligent resources offered by ICTs. This study aims to evaluate costs and benefits of using computerized and non-computerized system for managing health information in terms operational, economical feasibility and sustainability as way to propose a better alternative for managing health information in Kampfumo District - Maputo City, from year 2011 – 2013; taking into considerations the opportunity offered by ICTs.

According to Elton Marinho, 2013 [n.p], the information is the most valuable thing in this era. So, investing in the information management can ensure business survival.

2 METHODOLOGIES

2.1 Methods

According with Kaplan Cooper, 1998[n.p], cost reduction is an important managerial and organizational objective, conduct information system analysis separately may not be enough.

First method: Documental review of the *Mozambique Ministry of Health, Health Information System Matrix sourced from (2009 – 2014) National Strategic Health Plan*. The (2009 – 2014) National Strategic Health Plan identified and recommended ICTs as one of the best ways to improve the major four identified weaknesses of the MoH actual information system namely:

- It's not an effective, quality, and efficient system.

- Inadequate tools.
- The institutional capacity in the management of the information system is weak.
- Weak communication culture between MoH Departments.

The National Strategic Health Plan findings and recommendations have been also reinforced by the 2012 Health Sector Revision Report leaded by USAID, WHO, World Bank and Swiss cooperation to address medical products and technologies, and Health Information System and M&E.

Second method: *A cost benefits Analysis (CBA-1990)*. According to Fonesa, 2015 [n.p], this technique has the advantage, as the external effects and distortions observed are also considered. Kaldor & Hicks, 1939 [n.p], affirm that non project should be disapproved if it enhances the well-being of individuals; if those who obtain benefits are able to transfer to those who had the costs, enough value to compensate them. In this study we used a clone of classical formula; So, the direct and indirect beneficiaries of the health system in Kampfumo, District Municipality have been divided by the computerized and non-computerized system direct and indirect as demonstrated in the formula bellow.

Figure – 1. CBA – 1990 – Classical Formula

$$\frac{\sum_{t=1}^{n} B_t \times \dfrac{1}{(1 + r)^t}}{\sum_{t=1}^{n} C_t \times \dfrac{1}{(1 + r)^t}}$$

Sourced from: [http://www.dosalgarves.com/revistas/N13/7rev13.pdf].

CBA - Formula Units and Interpretations

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r - refresh rate or discount.
n – program duration period.
B_t - value of benefits in year "t"
C_t - value of costs in year "t"

Classical interpretation
- If the ratio is greater than 1, then the project is socially efficient

Study findings

$CBA_1 = B1(Kampfumo\ habitants) / C1\ (Computerized\ system\ unit\ cost) = 0,080\ MZN\ per\ year$

$CBA_2 = B2(Kampfumo\ habitants) / C1\ (non\text{-}computerized\ system\ unit\ cost) = 2.57\ MZN\ per\ year$

The third method: A structured questionnaire was applied individually to better abstract the information and finally, processed through *MS. Excel Advanced*. Fiftheen (15) Provincial, District managers and implementing partners were involved ad coverage by the qualitative research assessment.

The mixed method allowed the investigator to emphasize deductive reasoning and logical rules and on the other hand holistic and individual dynamic aspects of human experiences.

Figure -1. Conceptual framework of Economic Evaluation in Health
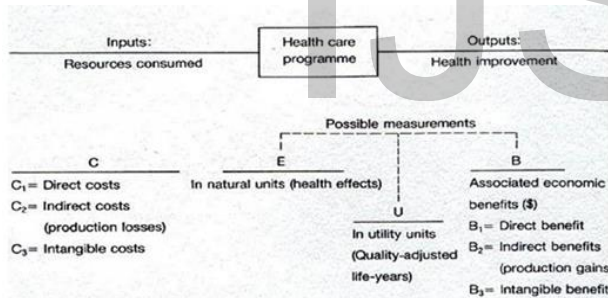

3. RESULTS

All participants fifteen (15), seniors and others health professional showed preference and confidence in the computerized system; About 75% believe that the computerized system will contribute to reducing the waiting time of patients and 85% consider the weak technical capacity to deal with the system is

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one of the biggest obstacles; also 67% consider the budget deficit as an imperative factor for the sustainability of the com-

puterized information system. The computirezed system as low cost per habitants received services comparing with non-computerized systems.

Figure -2. Average cost of non and computerized system per Kampfumo habitants per year.
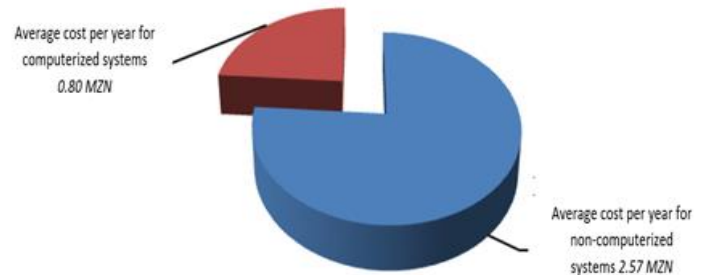
4. LIMITATIONS

The limitation of the study is related to some benefits of the computerized information system that are not quantifiable in terms of costs and this is dificult to be collected by the common tools and estimate their real value.

5. CONCLUSIONS

Clients in addition to lower prices and costs, also value quality, responsiveness, and punctuality; as well as the social benefit generated in public services.

We noted an agreement of the research facts, supported by the evaluation of the technical, operational, and economic feasibility the which demonstrate favoring for the adoption of a computerized information system from the point of view of costs and benefits.

6. RECOMMENDATIONS

i. The adoption of a computerized or mixed system would minimize the costs involved with basic and efficient systems and would allow for raising the standards of information management; and the budget balances could be directed to other priority areas of the economic and social plan of the health sector.

ii. The study recommends a gradual adoption of computerized systems for higher demand Health Facilities and, the adoption of mixed information management systems where the only primary sources would be the record books and all summaries should be generated automatically depending on the systematized and required information.

iii. The systematization of information would facilitate sources location, prevent loss and individualized management.

iv. Focus on training, before using computerized systems; so that the direct beneficiaries feel capable

    and increasingly interested and involved.

- v. Institutionalize the computerized information system.
- vi. Define a preventive maintenance plan for the computerized system.

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