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The History of a Hospital and Challenge of Expansion: Cost-Effectiveness and Surgical Coverage

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Abstract

The aims of this study are to estimate the cost effectiveness of ophthalmic procedures that were performed after expansion at Shahid Aso Eye Hospital, to analyse how much cost the expansion and rebuilding this hospital can save to the local community and to estimate the expansion of ophthalmic surgical coverage after rebuilding of Shahid Aso Eye hospital. Data collected was based on the retrospective data documented in Shahid Aso Eye Hospital before its expansion, and after its rebuilding to a new specialized hospital from a small department, in addition to that the survey of new ophthalmic branches in different districts of Sulaimani Governorate was incorporated into this study. Number of operations performed, number of doctors trained and increase in surgical coverage were calculated. The results showed that there is an increase in the cost per quality-adjusted life year (QALY) gained with ophthalmic surgeries and DALY. Furthermore, there is an increase in the surgical coverage in all the districts of Sulaimani governorate. In addition, there is an additional benefit of reviving estimated lost money of about 2000, 000-4000, 000 $ USA dollars to the local market. In the conclusion, expansion of Shahid Aso Hospital was beneficial for community from both health point of view and economically for the local market.

Keywords: ophthalmic surgery, DALY, QALY, cost effectiveness, Shahid Aso Eye Hospital.

1. INTRODUCTION

Ophthalmic diseases are one of the common health problems in Kurdistan region of Iraq. However, it is difficult to estimate their burden on life and economy of the population, as there are not enough systematic data about these diseases. In general, Iraq and Kurdistan health system lack the infrastructure for the adequate collection and documentation of the data both logistically and human resource wise. WHO estimates that likely there are 29 thousand blind and 87 thousand visually impaired people in IK. There are cases of allergy, visual impairment, and cataract. Most common causes of blindness in Kurdistan region of Iraq are cataract, diabetic retinopathy, trauma and glaucoma. Cataract alone accounts for almost 60 % of all blindness and visual impairment. Eye service captured least attention in planning, development and resource allocation. But this condition changed dramatically with the opening of Shahid Aso Eye hospital [1,2,3].

In a report prepared by a group of ophthalmologists from Sweden visiting Kurdistan region of Iraq, it has been stated that "Over the past several years, many government authorities, ophthalmologists and the public in general have expressed their unhappiness with the practice offered by the ophthalmic care services. The available resources in terms of personnel, infrastructure, and funds to deal with eye problems are not adequate. Despite the shortages of the ophthalmic resources everywhere in Kurdistan region of Iraq, still the available resources are not utilized optimally. Moreover, there are huge "interregional discrepancies in the distribution of available resources" [1,2]. This report was written in 2005 before opening of Shahid Aso Hospital and as it, with the rebuilding of the hospital and expansion of it. Resources have been allocated to increase the services that the hospital provides, it is also developed in two several departments each focusing on different aspects and anatomical parts of the eye. In parallel to that the number of the personnel, trained ophthalmologist and subspecialties were increased. In a way that ophthalmic services expanded in to rural and suburban hospitals, in connection with the Shahid Aso Eye hospital. Cataract coverage increased as a result of these expansions. Ophthalmologists trained and deployed to several hospitals outside city center. All these benefits, in addition to DALY and QALY that could be gained at the personal levels, the life of patients, are all considered as beneficial effects of the expansion of the hospital [1,2,3,4].

2. METHODS AND MATERIALS

In the retrospective review data at Shahid Aso Eye hospital retrieved and reviewed for the total number of operation that was increased in each year, in addition to the different types of investigation and services that were provided. The number of the personnel trained at different levels of ophthalmic work, like nurses, paramedics and doctors [3].

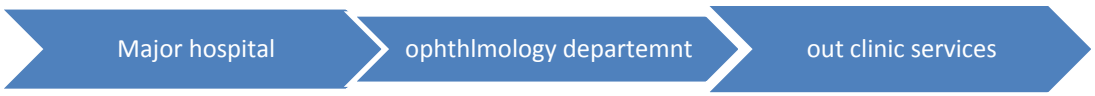
For analysis, the situation of the ophthalmic services in Kurdistan region of Iraq in 2005 was documented by an ophthalmologist from Sweden was taken as a base line standard and comparison point.

There are increase in ophthalmic services in different rural and suburbs of Sulaimani city in spite of all of the measurable benefits of this facility. QALY and DALY at the personal level and amount of economic saving to the community were calculated.

Data was collected and analyzed. Ethical consideration regulated by the ministry of higher education and ministry of health regarding the use of medical data was observed during the conduction of this study.

A Brief History of ophthalmic services in Sulaimani city

Sulaimani ophthalmology services were underdeveloped and was a part of the major hospital of the city including just five trained comprehensive ophthalmologists and the limited number of paramedics. Work load of the department was on average 100-200 cases, several private clinics with limited resources were present in the city. Unfortunately, the available resources were scarce because of the effect of subsequent political conflicts and economic sanctions that dramatically collapsed Iraq health system including Kurdistan region. This service was expanded and relocated into Chwar bakh hospital which is still as a part of hospital with limited space and capacities. In 2010, a new hospital was built with full ophthalmic services and equipment including: operation room, Phaco machine, glaucoma services, pediatric services and cornea services [3].



In 2005, the hospital was a part of General Medical Hospital, this was expanded to many branches and departments linked to Shahid Aso Eye hospital as an interconnected single corpus of ophthalmic services throughout the region.

3. RESULTS

A one glance if we look at the expansion of the hospital from the base line services in 2005, it can be seen that the ophthalmic services expanded dramatically, from just one department inside the major hospital in city center of Sulaimani to many departments within major hospitals and even to suburban areas in 2016 and the number of personnel in the ophthalmic services has increased dramatically in 2016 (Table 1).

Table 1: Increase in workforce

Type of professional	In 2005	In 2016
Trained Ophthalmologists	4	55
Nurses and paramedics	2	150

In general, the number of rural services has increased in 2016: Effect on ophthalmic work force was dramatic: it can be seen in the number of ophthalmic personnel and surgical units that increased and developed, from this small department into many departments within major hospitals of the different districts such as in Rania, Kalar and Halabja and there are operation rooms established with advanced equipment like Phaco machine. Furthermore, there are three ophthalmologists in average in the mentioned districts. In Warmawa, Darbandekhan, Pera magrwn and Dukan, there are ophthalmologists working in the outpatient services linked to Shahid Aso Eye Hospital. All these developments occurred after the expansion of Shahid Aso Eye Hospital (Table 2).

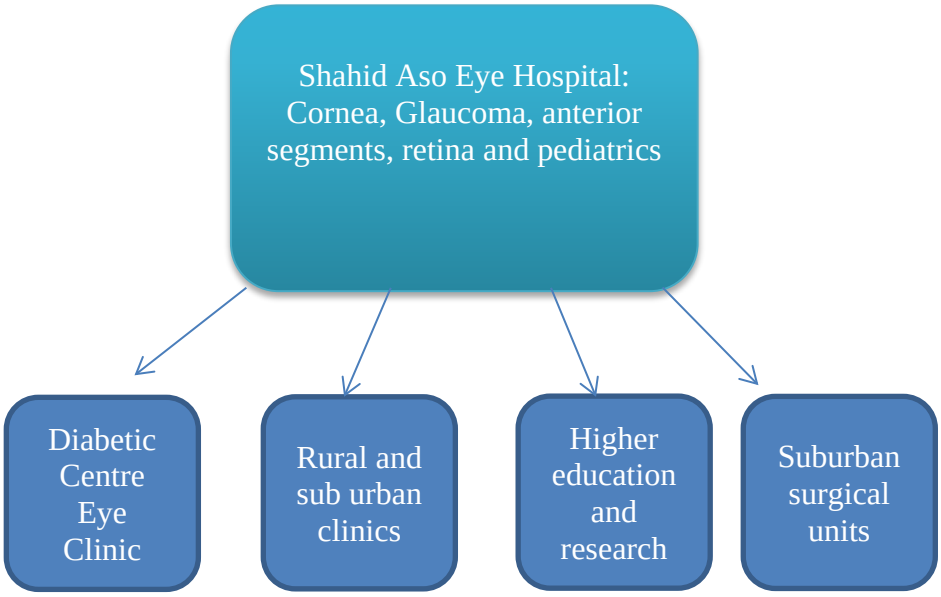


Figure 1: Diagram of ophthalmic services in Sulaimani city

Table 2: Expansion of Rural Ophthalmic Services

Rural service units	2005	2016
Rural service with surgical unit	0	4
Rural service units	2	10
Ophthalmic doctors	3	20
Ophthalmic medics and para/medics	5	35

Expansion of hospital and expansion on private sector

In Iraq and Kurdistan region, the private sector works in parallel with public sector, most of the medical professionals are working too in private sector. There are three private surgical ophthalmic departments, within private hospitals in the city. In average, they perform about 200 ophthalmic surgeries in Sulaimani city. These developments occurred after expansion of Shahid Aso Eye Hospital. But if we go back to 2005, the number of operation was 2495 and it increased in 2015 to 3715 operations. Then from 2015 the crises started and the hospital faced shortage in resource allocation. This affected the number of surgeries and services provided by the hospital (Table 3).

Table 3: Increase in Number of Operation

Year	Number of operation major	Number of minor operation	Total
2004	900	300	1200
2005	1962	533	2495
2013	4538	478	5016
2016	1918	363	2281

Effect on cataract surgical coverage

The definition of cataract surgical coverage (CSC) is the proportion of patients with "operable" cataract, who has already had surgical operation. It has been estimated by world health report 10 that approximately 20 million people are bilaterally blind from cataract related age. (WHO) it is an indicator to measure cataract intervention programs. For eyes with mature cataract, the cataract surgical coverage has been increases to about 80% [5]. Cataract surgical rate which is calculated as a number of eyes operated on per population, CSR is increased to (0.016).

The definition of CSC is the number of people in a defined population with operated cataract as a proportion of those having operable plus operated cataract [3,5].

Cost effectiveness of this expansion

The importance of Cost Effectiveness Analysis (CEA) is to provide information that is crucial policy makers for determining which type health interventions has the best financial value. The quality and length of life can be estimated by CEA. Specifically, additional years lived in a good health/ without morbidity, due to a specific health intervention and express this in terms of cost per DALY averted or QALY gained [5]. These measures are used in ophthalmic intervention, too. For example, average cost per QALY gained after cataract surgery is different from one country to another, average cost per QALY gained after cataract surgery in India is about 4-36 $ USA dollars and in United States is about 254-838$ [5,6].

Simply, the calculation of QALYs is performed by multiplying the period of time that spent in a health state by the HRQoL weight. Therefore, the two key elements of HRQoL and survival are incorporated [6].

DALY is the abbreviation for Disability Adjusted Life Years, is the measurement of burden of diseases including ophthalmic problems. One lost year of healthy life is considered as one DALY. Therefore, the sum of population DALYs can be considered as the measurement of gap between the current health status and an ideal health condition where the entire population lives to advanced age and is free of disease and disability [7,8].

These two measures are used to analyze socio-economic effect of any medical services worldwide. However, it is very difficult to measure QALY and DALY here, but if we calculate QALY just for cataract surgery it can be seen that, QALY in Sulaimani city of Kurdistan Region of Iraq as part of Middle East and developing countries is between 9-250 $ USA dollars, but DALY for most of the developing countries is about 90 $ USA, based on the level of income of similar countries, Iraq has the similar DALY number.

In general, if we estimate the amount of the money that this population who had cataract surgery would have used in getting these services from neighbor countries and we can conclude that about 2000000 $ USA have been saved to the local market.

Number of operation in year 2016 *estimated cost of this surgeries in neighbor countries

2000*2000=4000000 $ USA

In addition to the burden of the travel on the families and politics of the travel, that would have been affected the families in a negative way. The establishing processes that allow population with geographic and financial barriers to access is essential to prevent visual disability.

Diabetic Retinopathy

Globally, recent records revealed that around 382 million people are suffering from diabetes [1]. The most frequently occurring microvascular complication of diabetes is diabetic retinopathy and it affects approximately around 28% of patients with known diabetes and 11% of those is newly identified. Furthermore, it can affect nearly all patients with a sufficient duration of the disease ([8,9]. Due to asymptomatically pathophysiological changes in the eye

continue in the background; therefore, it is crucial that the diabetic patients to have a health check-up on a regular basis [10,11].
One of the duties of Shahid Aso Center is establishing guidelines for screening diabetic retinopathy, in addition, in collaboration with Shahid Aso Eye Hospital in diabetic clinic in Sulaimani, an eye clinic for documented diabetic patient have been opened and screens for any diabetic problems that may arise in those patients and gives advices about diabetic retinopathy and glycemic control.
The resources for this purpose supplied by Shahid Aso Eye Hospital as a mother institution, these include Doctors, nurses, training and guidelines. Even in those patients who develop sever diabetic retinopathy, the hospital depends on the available budget to provide injection for this purpose, this can save costs to local community. In past, people had to go to neighboring countries such as Iran and Turkey to receive the same treatment with a higher cost. This is in addition to the social costs that they had to afford while they were there. They had to support the person who was with them during the receiving local treatment.
Part of the outcome of the hospital work is to support and supervise provision of care in the city of Sulaimani and its surrounding district in both private and public sectors. The same type of treatment and screening are present in local districts.

Low vision and children eye care

However, vision screening is part of Iraq school health services, but structured department was not present within the hospital for this purpose, with establishing of this new hospital, space and capacity for this purpose has expanded, in a way that this department are connected to the screening programs for low vision in the schools and manage patients who are referred by public screening program, to provide more advanced treatment for them. However, the exact amount of reduction of amblyopia [3.4]. Decreased through this program cannot be estimated, but through the feedback of the center, approximately 25 children are assessed and diagnosed on daily bases.
Communication of hospital with the local community is maintained through media, TV and programs that are attended by physician from hospital to give awareness to the public about different eye problems, in addition there are social media pages that allow direct communication with the local community to give information about the services that Shahid Aso Eye Hospital can provide.

4. DISCUSSION

Globally, there are 37 and 124 million people with blind and living with a low vision respectively that recorded by WHO in 2002, in which 90% of them lives in the developing countries and the only patients who seek and have the ability to pay for the quality of eye care [10]. Unfortunately, in many countries of the world especially underdeveloped countries such as Iraq including Kurdistan region, ophthalmic services derive less attention in term for the plan for improvement and resource allocation [12,13].

In the developing countries, there is a stable but in reality, there is equal health eye care services available especially for those patients who have lower income, which leads to cause exclusion, marginalization for both patients who suffer from optic problems and eye care providers. Kurdistan region is not exclusion, too. In past, patient choices included an unaffordable private sector in the neighboring countries health care market or an inherently inefficient public system.

Building of eye care hospital as Shahid Aso Eye Hospital is a great achievement, it has important role in increasing productivity and greater equity due to an increased number of poor patients served. Cumulative result shows that, there are an increased coverage of surgeries for cataract, increase in the number of people that visited the clinic throughout the period since its establishment [11,12].

5. CONCLUSION

It can be concluded that Shahid Aso Eye Hospital was unique, in its cost effectiveness in delivery of care to most vulnerable people, in addition to increases trained ophthalmic personnel and surgical cataract coverage. It adds value to local market, and saves unnecessary costs that patients had to afford to go to neighboring countries for receiving of the treatment.

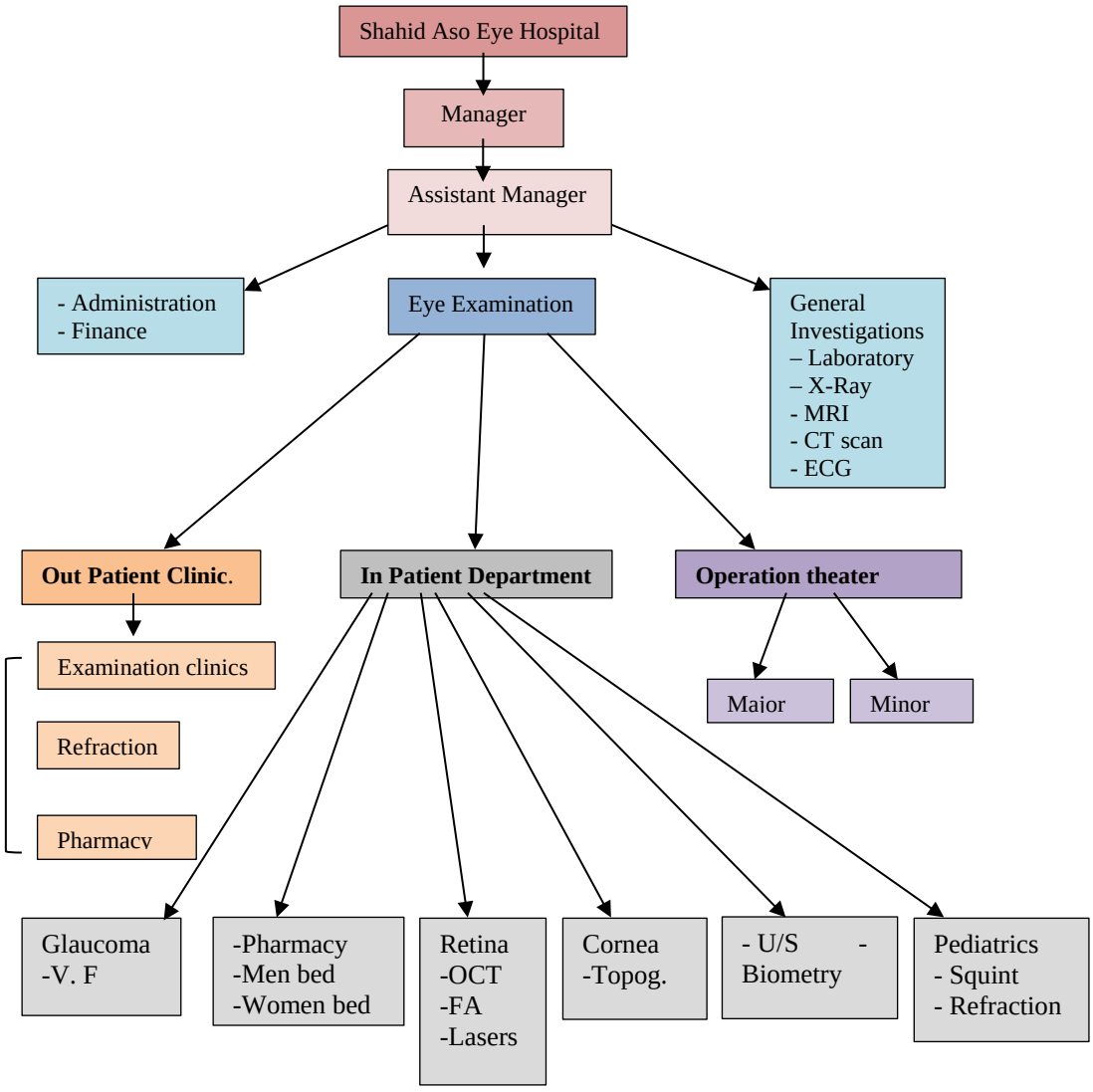


Figure 1: Diagram of Shahid Aso Eye Hospital

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