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Original Article

How Much Should We Pay to Deliver Comprehensive Mental and Social Health Services? Experiences from Iran

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Abstract

Objective: Comprehensive mental and social health services is the new benefit package which had been aimed to provide mental health services to people who suffer from mental disorders. The aim of this study was to estimate the cost of plan and its drivers to provide evidence for decision-making by national policymakers.
Method: We used the bottom-up costing approach to estimate the cost of plan. We identified the cost centers, services delivery process, and facilities. Data were collected via different sources and tools such as the new financial system, registration forms, and performance reporting forms. We categorized the cost into 4 groups and selected appropriate measures to estimate the cost. We estimate the total and unit cost for 3 levels in 2 scenarios by considering the 2017 prices.
Results: Screening resulted in 8.9% new detection with a different incidence in urban and rural areas (urban: 16.5%; rural: 2.7%). Also, 61 842 million IRR was spent for the screening, diagnose, treatment, and rehabilitation of detected people in 2017. Personal cost is responsible for 90.6% and primary screening for 66.4% of the total cost.
Conclusion: For the development of the program (from screening to rehabilitation) 530 513 IRR should be spent per capita. The cost of detection per client can vary due to differences in disease prevalence, especially treatment and rehabilitation costs. It is suggested to consider the variation of the prevalence in expanding the plan to the whole country. Integrating the services in primary health care lead to huge cost saving.

Key words: *Costing; Financing; Mental Disorder; Unit Cost*

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Mental health is an integral and essential component of health (1). Unfortunately, it is neglected in priority setting of policy-making and providing health care. Human, social, and financial resources will be needed to achieve the WHO objective of adequate access to effective and humane treatment for those who suffer from a mental disorder (1).

In spite of international concerns for mental health, it has not been a significant priority at national and international level (2, 3) and most countries spend on mental health services less than 1% of public financial resource (3).

Despite of increasing this disease, the recent estimation shows that mental disorders have greater than 10% prevalence in all 21 GBD regions (4).[1]

The studies in Iran show different ranges of mental disorder prevalence. Previous studies reported it 29.1% and 21.9% respectively based on screening and clinical diagnosis (5). The mental health survey in 2015 showed that 23.6% of adults had mental disorders (6). The results of the latest meta-analysis showed that the prevalence of psychiatric disorders reached to 31.03% and 25.42% in screening and clinical interviews, respectively (7).

However, the evidence shows that the prevalence of mental disorders in Iran is rising.

Despite the high prevalence and the high cost of mental disorders in household health expenditure, comprehensive services for suffering families have not yet been designed and provided. In this regard the Ministry of Health and Medical Education (MoHME) has designed a comprehensive benefit (package which is name Seraj[2]) and piloted it in 3 different regions of the country in 2016(8, 9). Countrywide expanding of this program needs additional and sustainable resources .

The resources are limited and the needs and demand for these resources are very high and unlimited (10). In the country, the various sectors compete to absorb the resources and this is true in health care. Therefore, scarcity of financial resources leads to competing alternatives (11). In this situation it is necessary that policymakers decide about the resource allocation. The cost and outcome or consequences of interventions are required to advise policymakers in optimizing limited resources (11).

There are many evidences which demonstrate the effectiveness of mental health intervention and treatments for mental disorders. Some of them are relatively cost-effective (12) and others may be highly cost-effective compared to taking no interventions (13, 14). Despite strong evidences at outcome side and cost-effective interventions, the studies and reports show that (3) the resources for mental health are ineffectively distributed or insufficient (15). Insufficient funding has been identified as a key barrier to providing comprehensive services and improving mental health care (2, 15, 16). This problem is common (3), widespread, systematic, and long-term in most low-income and middle-income countries (1). There is an insignificant priority to mental health because of financial restriction in these countries (1). These findings substantiate a global need for promoting mental health, making a right policy and avoiding the waste of the resources (4).

While mental health faces with limited resources and less priority, mental health policymakers should ensure that the sources are properly used and mental health interventions and the programs are well defined based on the outcome and costs (2). Many projects failed because of lack of attention to economic consequence and inappropriate estimation of required resources (17, 18). There is no financial study to support the mental health services in Iran. Therefore, before expanding Seraj in the country, in this study we aimed to estimate financial resource, which is needed to implement Seraj in Iran and its costs determinants.

Iran's comprehensive mental and social health services, the Seraj program

Seraj is a comprehensive mental health service which has been designed in 3 packages: basic, advanced, and social services. A basic package includes social and mental health screening, providing basic health services and treatment, and public education based on social and mental health skills (19). At this level, the cases with target of mental conditions are recognized and referred for further evaluation and intervention to mental health specialists. Basic mental health services are provided in the health centers by community health workers, socio-mental health experts and general practitioners (8). Advanced services package includes the treatment of psychosis and mood disorders for outpatient and inpatients and also post discharge services. Many patients in this level are referred from the first level. These services should be delivered in the hospital and clinic by a collaborative care team (psychologists, clinical psychiatrists, etc.) (8). Social services package aims to organize and improve intersectorial cooperation and public participation to improve mental and social health, and also reduce the mental risk factors and enhancing social supports(19). In this level social and financial supports are provided to people to return to the society in full mental health and social healthy status.

Materials and Methods

The resources which are used to produce and deliver health care are the determinants of the health services costs. The value of resources and the costs are measured

[1] GBD created regions based on 2 criteria: epidemiological similarity and geographic closeness. This has resulted in 7 GBD supper regions and 21 regions. To see a full list of countries and their corresponding regions please refer to www.healthdata.org› GBD › GBD Regions countries or www.healthdata.org› GBD› faq

[2] Seraj is a Persian mnemonic or brand name for Comprehensive Mental and Social Services Model in Islamic Republic of Iran.

by appropriate workload indices and finally it is reported in the form of the cost per unit service or a client (20).This was a cross sectional descriptive study in the field of applied microeconomics studies. We used cost analysis method to estimate the cost per capita in Seraj Project.

Study Design and Analysis

To analyze the actual cost of mental health services, we used the bottom-up costing approach, which is known as micro-costing or detailed costing method (21). This approach provides more accurate details of the cost report for each product or center. It provides the cost drivers and relative cost of different services within the cost centers and departments (21).This approach yields consistent, reliable, and more suitable data for econometric and statistical analysis. We can measure the actual quantity of resources consumed by the predefined cost units (for example patients or products).

All expenditures in the bottom-up approach were assigned to specific department and allocated to the final defined products or cost units based on some criteria. Finally, the average cost for a particular service or a patient group was constructed (22).We defined the following 7 steps to select costing method and conduct it :

1. We identified services packages and process of services delivery by studying the Seraj materials.
2. We went to the service providing facilities to adapt and validate the process and services package in practice with predefined program. We observed the process of service delivery and existing data in the field and added some details and corrected some processes and redefined our steps and final products for the costs.
3. We defined final and supporting cost centers. In this study we identified 3 cost centers: inpatient unit (mental health department), outpatient care unit, which is known as specialized mental health center (SMHC) and health network management center.
4. The cost unit or final product is the next step in our study. We used the predefined benefit package for first (Basic package) and second (specialized package) levels as final products.
5. We explored the process and activities in the cost units and created linkage between the products and activities by conducting the interview with owners of the process and direct observation.
6. We identified the inputs and resources absorption by the activities and cost centers. Then, inputs were assigned to the various cost centers either directly or by allocation rules and calculation of input costs, obtained from the accrual accounting system 7. Finally, we aggregated the cost of activities, which is needed to provide the service package. In this study we used the Ministry of Health perspective to find and calculate intervention and program cost. Data were obtained for 6 months and estimated for 1 year according to the Iranian fiscal year.

Data Collection and Sources

To obtain real data, we selected one of the 3 piloted program centers (Osku County). Data were collected via different tools and sources in this service provider's field. Data availability, quality of data, and head of program interest in the field to incorporate in the study were the main reasons for selection of the data filed. The sources of data included system financial management system known as the new financial system, registration forms, and performance reporting forms, which were used to report the results in each step of screening and service delivering, annual formal report, interviews with the informed experts and practitioners or the head of departments, and facilities site visits. Data gathering forms are designed by the research team and adapted and validated it by the site visit.

Cost Estimation

We categorized the cost in 4 groups: personals or human resources costs, facility for services providing costs (consisting of establishing, repairing, and maintenance cost), tools and consumable instruments (consist of offices supplies and medical devices), and overhead cost. We used the number of hours of work for part time and monthly compensation of employees (gross salaries in cash and kind, and actual and imputed social contributions and taxes) for fulltime personals. The cost of consumable devices and commodities was estimated by the real cost and number of used commodities in the past year. For the overhead cost estimation, we used different criteria based on type of services or cost agents . For gasoline, diesel, and oil, we used the monthly usage rate in liters. Internet cost was estimated by the computer sets which were connected to the internet. Gas, electricity, and water costs were estimated by the share of occupied area by squire meter. Finally, telephone cost was computed by the number of users. To estimate capital expenditure, we estimated it annually according to the guideline of ministry of finance. Finally, the costs were estimated for 3 levels in 2 scenarios: The cost which was paid by health services providers and real unit cost of services. The total and unit costs were estimated for 2017 Iranian fiscal year.

Results

The results are described in 2 main categories: At first the result of screening is proposed. However, as the screening results were not directly the aim of this study and since the number of screening cases and new cases affected the cost per case of screening and cost per new cost detection, we present the screening results and then we explain the costing results.

Screening

Mental health services (from screening to rehabilitation services) are delivered in the health network facilities of the pilot region (Osku). In this county there are 10 comprehensive health centers, 28 health houses, 2 health

posts, and 1 hospital with a mental and neurological department with 10 beds .

Usually in the screening plan the workload is determined by the total population, which is screened by health practitioners. In the first step of screening by questionnaire, 58 285 people were screened in the study time horizon (Table 1). In this step10.88% of people had a positive sign and were referred to the general physician. Primary screening results showed that the positive rate differs by area of residency. We found 16.27% and 6.4% of screened people were positive and met the criteria for more assessment in urban and rural areas, respectively. In the next step, general physicians found 60.19% (79.3% of urban and 20.59% of rural areas) of referred people had at least one type of mental disorders. Therefore, screening resulted in early detection of 3816 patients. In addition, some patients who went directly (without referral) to the clinic and visited by general physicians (n = 1399). In total, in this period we found 5215 patients who constituted 9% of the total screened people. Patients received the general and special care after diagnose. Nearly 10% of patients referred to specialized services level and 2847 cases referred to mental and social experts (which is named KARA) to receive mental and social care and services.

Costing

As mentioned in the methodology section, the cost was estimated in 2 scenarios. Real unit cost (costing approach) and money paid (budgeting approach). First, we presented the real cost. Then, the real payment to the human and other resources (budgeting approach results) were presented. On the other hand, based on the level of service provision, we present costing results for each levels and cost centers .

In total, we estimated 61842 million Iranian Rials (IRR) for screening 116 570 people, based on 2017 data. Since the primary screening centers are the first level service providers and they screen all predefined people, so they are responsible for more than 66% (41034 million Iranian Rial (IRR)) of the total cost. Services in this level are provided in the health network setting and do not need more facilities and consumable supplies. Therefore, human resources are the main resources and are responsible for more than 99% of the total cost in this level. Personnel expenditure consists of wage and salary, bonus, welfare costs, social contributions, tax and performance-based payment (Fee for services). Maintenance and repair expenditure and overhead cost were estimated 101 and 24 million IRR, respectively .

In the second (specialized) level we had 2 health care delivery centers: hospitals for inpatients services and centers for Mental Health Care (CMHC) for outpatient services. Table 2 shows the details of expenditures in this level, which was estimated 19 765 million IRR, which has been spent for providing specialized services in 2017. Based on our estimation, more than 85% of funds (16 821million IRR) were spent in hospitals to provide the inpatient services in this level. Similar to basic level, personnel cost is still the highest cost and the next is consumable commodities (32% of total costs) .

There are 3 levels for planning and supervision of Seraj. Ministry of Health as the highest level has developed the program and supervised the program in the country. The deputy of health and County Health Network Administration Center (CHNAC) is responsible for managing and supervision at the province and county level, respectively. We estimated the cost of only one of these 3 levels (the last one) as supervision and administrative cost. The County Health Network Administration Center provides financial, administrative, and supportive services in addition to supervision. Results showed that 1042 million IRR has been spent for the mentioned affairs by the county health network administration center. Personnel expenditure was responsible for 88% of the supervision and administrative expenditure.

In total, comparing the cost centers and cost items show that primary screening centers, hospital, and CMHC are responsible for more than 66.4%, 27.2%, and 4.8% of the expenditures, respectively (Table 2). Only 1.7% of the total expenditure was spent for administrative and supervision. On the other hand, personnel costs were responsible for more than 90% of the expenditure, which varied in different cost centers.

Table 2 shows the detail of cost by cost centers. However, in fact there were some inactive and unused resources in the health system which can be used. Based on our finding and observation of Seraj project implementation process, these resources have been used to fulfill some activities of Seraj project. Therefore, the real expenditure differed from extra budgetary, which is needed to fulfill the project. In this study we estimated the real financial payment for screening and service delivery in the piloted area. Table 3 shows the details of the payment or budgetary approach in 4 cost centers. No payment was paid for supervision and administration in the study year. The costs and payments were different in all cost centers and the items. In total, 26 242 million IRR was paid for 1 year. In the other words, 225 135 IRR was spent compared to 530 513 IRR as the cost per cases. In the budgetary approach, personnel cost was responsible for 58.6% of the total cost. Maintenance, replacement, and depreciation were responsible for 31.8% of the total cost and consumable commodities were the next main cost item (8.9%). In this approach, we found hospitals were the main cost centers (76.9%), CMHC and primary screening centers were responsible for 15.6% and 7.5 % of the total cost.

Table1. Number of People Screened and Patients Referred to Next Levels

Area	Primary Screening				Diagnose and General Medical Practice (First Level of Referral)					Specialized Medical Practice (Second Level of Referral)		
	Total screened population	Screening results								Refer to psychiatrist		Refer to MSE
		Negative	Positive	(%)	Negative	Positive	Positive (%)	DDRGP	Total Patients	Number	(%)	
Urban	26279	22003	4276	16.27	885	3391	79.3	941	4332	372	8.6	2441
Rural	32006	29942	2064	6.4	1639	425	20.59	458	883	146	16.5	406
Total (6month)	58285	51945	6340	10.88	2524	3816	60.19	1399	5215	518	9.9	2847

DDRGP: Diagnosed from Direct Refer to GP. MSE: Mental and Social Expert (KARA)

Table 2. Total Cost, Cost Drivers, and Cost Center of CMHC

Cost Center/ Cost Drivers	Personnel Cost	Maintenance, Replacement and Depreciation	Overhead	Consumable Commodities	Other	Total (IRR Million)	(%)
Primary screening centers	40,909	101	24	0	0	41,034	66.4
CMHC	2,523	56	35	162	168	2,944	4.8
Hospital	11,674	698	94	4355	0	16,821	27.2
CHNAC	915	102	25	0	0	1,042	1.7
Total	56,021	957	178	4,518	168	61,842	100
(%)	90.6	1.5	0.3	7.3	0.3	100	

CHNAC: County Health Network Administration Center
CMHC: Centers for Mental Health Care

Table 3. The Amount of Payment in the Levels of Health Delivery

Cost items/ Cost Centers	Personnel cost	Maintenance, replacement and depreciation	Overhead	Consumable commodities	Other	Total	(%)
Primary screening centers	1,655	316	0	0	0	1,971	7.5
Hospital	11,674	6339	0	2178	0	20,191	76.9
CMHC	2,037	1679.5	35	162	168	4,082	15.6
CHNAC	0	0	0	0	0	0	0.0
Total	15,366	8,335	35	2,340	168	26,244	100
(%)	58.6	31.8	0.1	8.9	0.6	100	

Discussion

Cost estimation is a fundamental and basic activity of a health project and health care delivery. It is used in the budgeting of plans at all levels in all economic evaluations analysis and priority settings. It is necessary for setting of the health services tariff and establishing reimbursement rates. The cost data is used in assessing the return to investments in health services delivery strategies or setting (23). In this study we used the cost data to predict and estimate the nationwide cost of Seraj project implementation. Therefore, it is highly important to know the unit cost of screened community and the cost per new detection.

The primary screening indicated 10.88% of the positive cases who had the signs and symptoms of mental disorder. The analysis of the referral rate and prevalence of mental disorders showed that it differs by geographic location and residency. We found that the referral rate in urban areas is 2.5 times more than the rural areas. Moreover, the diagnostic rate in urban areas was also 3.9 times more than that of the rural areas. However, false referral led to extra consumption of resources and increased the cost per screening and detection. Published screening evidence showed that the prevalence of mental disorders in Iran was 29.1%, while the clinical diagnosis revealed it to be 21.9% (5); also, the mental health

survey showed that 23.6% of adults had mental disorders (6, 24). It seems the prevalence of mental disorder was very low in the pilot area compared to the country. If we trust the initial results of the screening (that is, if the initial results of the screening are correct), it means that the prevalence of mental disorders in this area is low. Then, the cost of diagnosing new cases increases. The cost of detecting new cases in areas with a high prevalence may be lower than in the study area. Therefore, we must ensure about the low prevalence in the regio) before generalizing it to the whole country. In addition to screening data, the cost data is also controversial. Healthcare costs are inherently difficult to measure and in the most health cost analyses data are gathered for many purposes, many of which are different from healthcare costing aims. Data gathering is expensive and it is not cost-effective to collect data specifically for costing and there is not yet consensus on how to do it effectively. On other hand, there is no consensus on method of costing and valuing the resources. There is no consensus on costing methods as well as valuation (pricing) of resources. However, it is recommended to use the cost of economic opportunity to value resources and activities. In reality, it is highly difficult to measure the opportunity cost and there are substantial variations in how to apply it (23). It is very important to pay attention to the perspective. The outlook changes the outcome of the costing study. In this study, we used the health system outlook and 2 scenarios to estimate the costs mentioned in the methodology.

Comparing the unit cost and payment shows that the payment is much less than the unit cost. In the long run, the two should not be too different because some fees, such as the reward for a home visit, must be paid (which is not currently paid).

At the basic level, existing personnel and facilities (buildings, etc.) were used to provide services, so the cost and amount of payment are very different. Therefore, the difference between the unit cost and payment is great. We evaluated a pilot implementation of project and maybe it would be different when it will be expanded in the country. In the second level there is a big difference in existing the facilities between the county and universities. Some of them have mental health departments and outpatient facilities and some do not. On the other hand, the prevalence of mental disorder varied by geographical, methodological, and socioeconomic factors (25). This affects the budgeting and unit cost, specifically treatment and rehabilitation expenditure. Thus, it is necessary to be considered it in the countrywide budgeting .

However, based on our study, we estimated the screening of 116 570 people and providing subsequent general and specialized service to be 61 842 million IRR. In other words, we estimated 530 513 IRR per capita for the screening, treatment, and rehabilitation of detected people. By supposing the same condition and prevalence of mental disorder across the country, expanding the plan to the country needs 530 513 IRR per capita based on the prices in 2017. It is clear the differences in the existing facilities and prevalence of illness needs different resources.

The human resources are the main cost driver and it is responsible for 90% and 58.6% of the total cost in costing and budgeting approach, respectively. The World Health Organization has estimated the personal cost to be almost 54% in the Mental Health Policy and Service Guidance Package (26). However, WHO estimation is based on the budgeting approach and it is close to our estimation in same approach.

Providing the facilities and maintenance costs are the next main costs in the budgetary approach. The facility is an asset and such resources are consumed over time (in a few years). Therefore, their costs should be estimated for each year. We annualized it based on depreciation rate based on the Ministry of Finance instruction to be 31.8% of the total budget and WHO estimated it to be 40%. However, WHO has supposed that all of the facilities must be constructed or rented (26). Therefore, the capital formation and facilities installation have a high share in the budget. In our study services are delivered in the existing facilities and there is no need for installation. It is clear we should construct it if we cannot provide the services in the existing facilities.

Payment details (Table 3) shows that the idle human resources have been used in practice. Therefore, the share of personals cost decreased to 56.6%, leading to a huge cost saving of the plan and enhancing the efficiency and productivity of existing labor. Based on the payment details, 225131 IRR is paid per capita for the screening, diagnose, treatment, and rehabilitation of the detected people.

However, in the planning and budgeting of health services for the psychiatric patients we can think about the various financing sources. The charities centers, health insurance, and out-of- pocket are the alternative sources for public resources. These sources have different roles in financing of mental health services in different countries. Worldwide statistics show that the most common source is the public, which is mobilized by taxation (60%) and social insurance (19%). Private sources for instance out-of-pocket payments (16%) and voluntary insurance (2%) are the second option, but in low income countries OOP is the main source of mental health financing (1).

Limitation

We had some limitations in this study.There are many factors which affect the unit cost of services such as efficiency, existing facilities, type, and number of human resources, distance, and etc. Therefore, the unit cost of each project is unique and this should be considered in generalization. The third package of Seraj was not included in this costing study and was mainly financed by charity and out of health sector. These resources are

varied by county and provinces. Finally, we analyzed the unit cost of piloted area of service delivery setting and this may be different from general installation because of the limited resources, monitoring system, motivation factors, and fiscal space of charity resources.

Conclusion

We estimated the cost of establishing Seraj and screening of 116 570 people to be 61842 million IRR (530513 IRR per capita) in 2017. We concluded that the first package requires more financial resources, (near 2 times than the other). Seraj is a comprehensive service, which is delivered in different health facilities. It is highly important to determine how many facilities are needed and how many are available. We found the real payment is very low compared to unit cost, and this should be taken in to account when the policymakers aim to expand the plan countrywide. On the other hand, this means when a plan integrates in the health network setting it is possible to run it easily and cost-effectively. For the county level and expanding the project, we suggest that the policymakers compute the cost of the third package and define specific financial resources, especially in the first years. Finally, we suggest designing an information system and a reporting method to easily access data, facilitate decision-making, and implementation.

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Conflict of Interest

All authors declare that they have no significant competing interests.

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