CHAPTER VIII

COMPARING BETWEEN THAI MENTAL HEALTH CASEMIX CLASSIFICATION MODELS

This chapter illustrated the two mental health casemix classification models: Thai Diagnosis Related Group (TDRG) which is using in allocation nowadays and Thai Mental Health Casemix Classification (TMHCC) which constructed here for using as alternative method in allocation. It also compared performance between two models. The chapter details consists of models' detail and performance in varies aspects, discussion and conclusions as below.

1. Background of casemix classification

Like other countries, Thailand has developed on Diagnosis Related Group (DRG) since 1993. The first version of DRG was implemented with the reinsurance payment in the public welfare card in 1998 and the voluntary health card in 1999 (Office of the Prime Minister, 2002); (Ministry of Public Health, 2001). Thailand has presently used relative weight of TDRG version 3.5 for reimbursement for inpatient in public sector (Ministry of Public Health, 2001). By TDRG approach, public health budget shall be allocated into acute care and sub-acute and non-acute care. Psychiatric health budget has been currently applied with TDRG which is inappropriate when applying into the mental health system (Phuaphanprasert et al, 2003); (Lee et al, 1998). Even DRG is derived mainly from diagnosis and operating procedure but DRG still has some limitations when applying into sub-acute and non-acute disease including mental illnesses. This is because TDRG inadequately takes into account the special circumstances of patients requiring a long hospital stay and TDRG is also unable to take into account of the severity of symptoms which has few group classification and service

types (Phuaphanprasert et al, 2003); (Pfeiffer & Hofdijk, 2002); (Pannarunothai, 1999); (Lee et al, 1998); (Buckingham et al, 1998); (Casas et al, 1993).

Since DRG incompletely describes costs of rehabilitation medicine, readmission rate and nursing home admissions is likely to increase and quality of care is likely to deteriorate, as measured by changes in length of hospital stay. Due to the above problems, providers misbehaviors have been encouraged by decreasing psychiatric inpatients, non-profit services, and hospital stay in tertiary psychiatric care level and by increasing psychiatric inpatient admissions and readmissions in primary and secondary care level (Phuaphanprasert et al, 2003).

Sub-Acute and Non-Acute Patient Classification (SNAP) has been firstly developed since 1992 in USA. Many developed countries such as Australian and Sweden has long experienced in developing mental health casemix systems. Even Australia has developed several versions of DRGs, Australian government has finally supported the development of casemix system for sub-acute and non-acute patient for budget allocation called the Australian National Sub-Acute and Non-Acute Patient Classification (AN-SNAP) and casemix system for mental health care called the Mental Health Classification and Service Costs (MH-CASC) (Buckingham et al, 1998). Australia has come up with a 3-year mental health policy since 1997. MH-CASC classifies patients by clinical symptom and similar resources use, which categorizes services into 3 groups: acute inpatient units, non-acute inpatient units and community services (Buckingham et al, 1998). MH-CASC used many predictive factors to classify psychiatric patients. By this approach, budget allocation depends upon patient characteristics comprising diagnosis, age, co-morbidity, complication, severity of symptom, level of function and social status, risk to harm to himself and others, socio-geographic characteristics, and state of disease. This psychiatric casemix system was generally accepted to be better than DRG when applied to sub-acute and non-acute patients, which lead to more equity in budget allocation (Buckingham et al, 1998).

However, direct implication of any foreign system without adjustment are likely to give high costs and burdens to any system-applying country because each country has its own unique factors such as treatment pattern, social, and cultural characteristics. Thai mental health budget allocation system needs appropriate policy planning and development to respond to rapid current changes in the health system. Based upon our available database, we find a development potential in casemix system by studying alternative public health budget allocation for psychiatric care. We expect the proposed method shall be well-designed system and good policy making. Additionally, this alternative approach shall give more equity to all stakeholders, reduce conflicts of interests among related parties, and enhance service quality (Buckingham et al, 1998).

2. Materials and methods of comparing casemix classification models

2.1 Study design

This study compared performance of TDRG and TMHCC by using the alternative analysis allocation methods composed of four steps (Hogwood & Gunn, 1984); (Ratanasak, 2002). The first step, all alternative were described and new models were found out. The second phase, all alternative allocation approaches were classified. This step describes detail of each allocation method in characteristic, content, and criteria by definition. Alternative should answer 4 major questions; (1) feasibility of alternative allocation in terms of techinque and economic, (2) capability to implementation, (3) benefits and costs of each approach, and (4) time criteria of each approach. The third phase, all alternatives were evaluated and compared by appropriate criteria. This step evaluates probabilities of each alternative in policy making process. The importance process of policy making should classify and assess. The finally phase, the appropriate alternative was proposed to policy makers for implement.

2.2 Casemix classification models

The two alternative approaches were selected, TDRG that has been currently used by allocating budget on capitation basis and TMHCC that was developed by casemix classification approach from this study.

Thai Diagnosis Related Group (TDRG): Thailand has researched casemix systems especially on DRG since 1993 after the implementing the Road Traffic Accident Protection Act. DRG 1st version was used in the reinsurance payment in the public welfare card in 1998 and the voluntary health card in 1999. Later in 2000, DRG 2nd version, after adjusting reference database to cover all disease codes was released, and 3rd version, the lastest one, in 2003. This version has detailed in disease classification according to its severity and complications and co-morbidities. There are 7 additional disease groups for psychiatric inpatients to the 14 groups in 1999 to be 21 groups in 2003 as stated in Table 50 Thai Diagnosis Related Group (TDRG) Ministry of Public Health (2001).

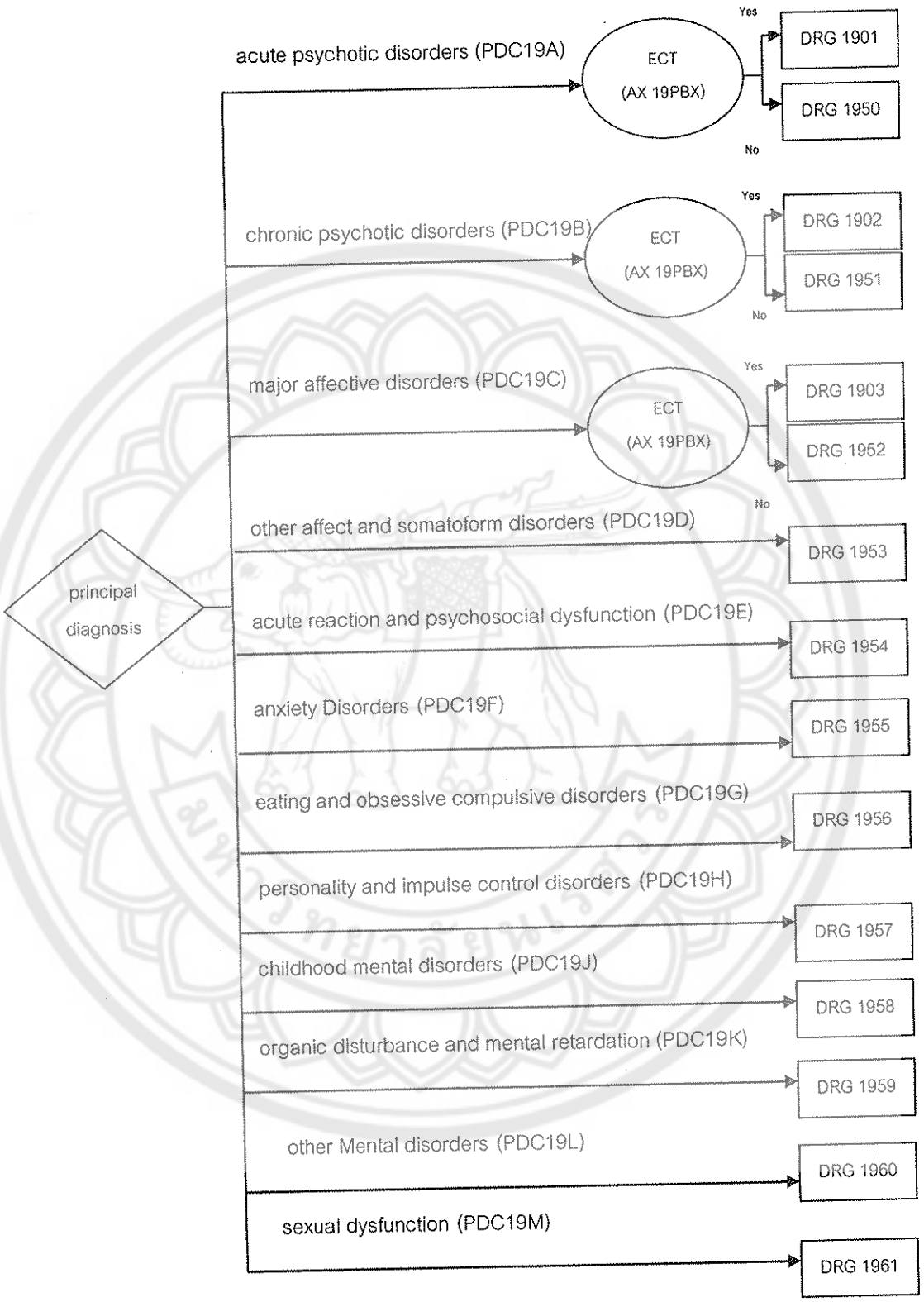
Thai Diagnosis Related Group (TDRG) had long developed by the Health Institute since 1983 (Ronald et al, 2003); (Michie et al, 1994); (Joseph, 1996). In 1998 in the reinsurance payment in the public welfare card, 1st version DRG had been implemented in the Road Traffic Accident Protection Act. Later in 2000, DRG 2nd version was released after adjusting reference database to cover all disease codes and the latest version has been implemented since 2003. This version has been modified by enlarging diagnosis, adding complications and co-morbidities (CC), and using a mental health measurement as a tool for budget allocation. In TDRG Grouper version 3.5, the system was classified into 2 Major Diagnostic Category (MDC), or 25 DRG, and 1 Pre MDC (Michie et al, 1994); (Joseph, 1996; pp. 30-1).

TDRG grouped inpatients by principle diagnosis in (ICD-10). There were 3 MDC from a total of 25 MDC consisted of (1) MDC 19: Mental diseases and disorders, (2) MDC 20: Alcohol/Drug use and Alcohol/Drug induced organic mental disorders, and (3) MDC 1: Diseases and Disorders of the nervous system (Michie et al, 1994); (Joseph, 1996; pp. 30-1) as shown in Figures 30-31. Table 50 illustrated TDRGs' code and definition of mental health groups. There were 22 disease categories (DC) consisting of MDC 19 or 15 DRG, MDC 20 or 6 DRG, and MDC 1 or 1 DRG.

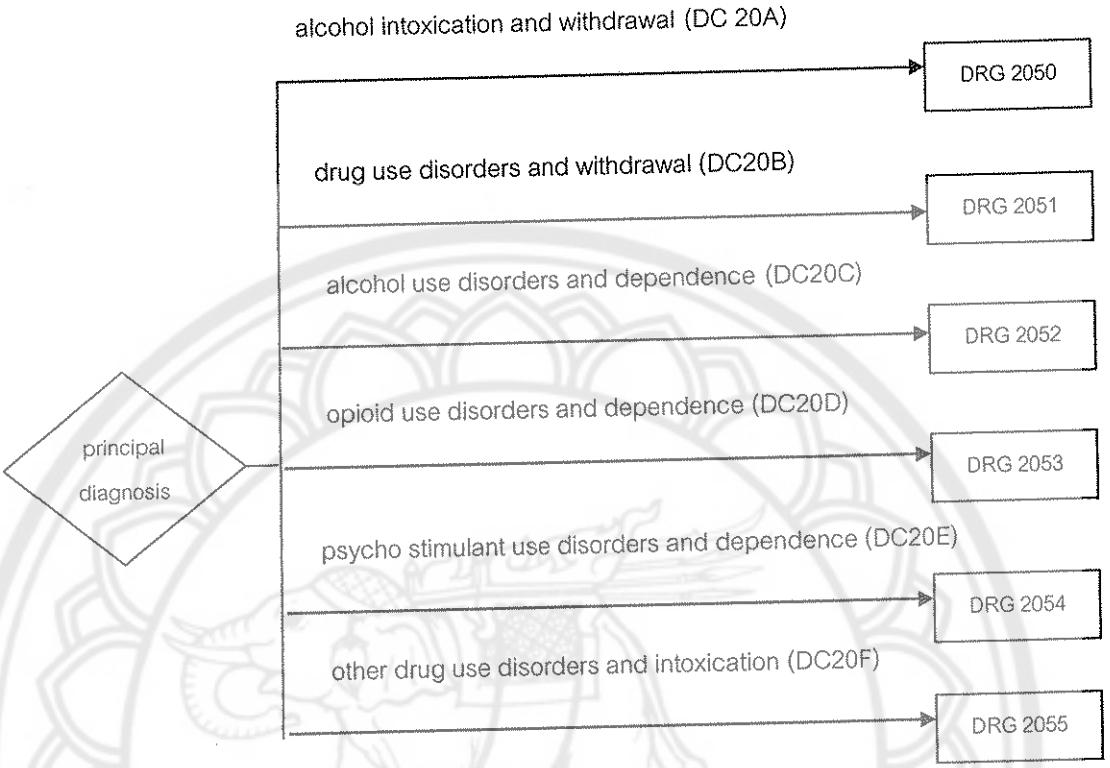
Table 50 DRG's code and definition of TDRG in mental health sector

	MDC	DC	Definition	DRG
1	19	1901	acute psychotic disorders with ECT *	19010, 19014
2	19	1902	chronic psychotic disorders with ECT *	19020, 19024
3	19	1903	major affective disorders with ECT *	19030, 19034
4	19	1950	acute psychotic disorders	19500, 19504
5	19	1951	chronic psychotic disorders	19510, 19512, 19514
6	19	1952	major affective disorders	19520, 19522, 19524
7	19	1953	other affect and somatoform disorders	19530, 19532, 19534
8	19	1954	acute reaction and psychosocial dysfunction	19540, 19544
9	19	1955	anxiety disorders	19550, 19552, 19554
10	19	1956	eating and obsessive compulsive disorders	19560, 19564
11	19	1957	personality and impulse control disorders	19570, 19574
12	19	1958	childhood mental disorders	19580, 19584
13	19	1959	organic disturbance and mental retardation	19590, 19593, 19594
14	19	1960	other mental disorders	19600, 19604
15	19	1961	sexual dysfunction	19619
16	20	2050	alcohol intoxication and withdrawal	20500, 20504
17	20	2051	drug use disorders and withdrawal	20510, 20514
18	20	2052	alcohol use disorders and dependence	20520, 20522, 20524
19	20	2053	opioid use disorders and dependence	20530, 20532, 20534
20	20	2054	psycho stimulant use disorders and dependence	20540, 20544
21	20	2055	other drug use disorders and intoxication	20550, 20554
22	01	163	seizure disorders	01630, 01632, 01633, 01634

Abbreviation: ECT * = electro convulsive therapy



Figures 30 MDC 19 in DRG



Figures 31 MDC 20 in DRG

Thai mental casemic classification (TMHCC): The TMHCC was described in detail in the precious chapter already.

2.3 Subjects

The subjects were the same as using in chapter VII before.

2.4 Data analysis

Data analysis performances in this part considered on 5 main aspects.

3. Comparing of variable in models

In general, casemix classification model needs various factors for constructing models both from service providers' view and service receivers or patients' views.

Factors from service providers' view of point composed of number of receiving procedures, type of service setting, etc., while patient service providers' view of point composed of patients' diagnosis, their clinical symptom, their functioning, age, sex, etc.. However, not all reflecting resources used factors are available or appropriate to using in constructing classification models. Some factors are uncountable factors such as providers' ethic, etc.. Some are impropriate factors for classification models such as socio-economic status, marriage status.

The results from comparing of essential factors in TMHCC and TDRG had both similarity and difference. They used similar factors such as principle diagnosis (PDx) in the first node of classification and age in the next step of classification.

The difference of essential factors between the two models was TDRG using patient's procedure and addition diagnosis for classification while TMHCC using clinical symptom from mental health measurement. The clinical symptom from mental health measurement using in TMHCC composed of problems resulting from overactive/aggressive/disruptive/agitated behavior, suicidal thoughts or behavior, detoxication, cognitive problems, depressed mood, other mental and behavioural problems, and problems making supportive social relationships.

Table 51 shows the essential variables in each subclass in the two involving models. The TDRG need no clinical factor in classification while TMHCC need varies clinical factor but not covers all of the potential predictors of resource use.

Table 51 Comparing variables for constructing classification models

	Variables	TDRG	TMHCC
1.	Diagnosis 1.1 principle diagnosis	✓	✓
	1.2 addition diagnosis	✓	×
2.	Age	✓	✓
3.	clinical symptom		
3.1	problems resulting from aggressive/disruptive/agitated behavior	×	✓
3.2	suicidal thoughts or behavior; non-accidental self-injury	×	✓
3.3	detoxication	×	✓
3.4	cognitive problems involving memory/orientation/understanding	×	✓
3.5	depressed mood	×	✓
3.6	other mental and behavioural problems	×	✓
3.7	problems making supportive social relationships	×	✓

Table 52 shows the essential variables for each disease cluster (DC) in TMHCC and TDRG that they used difference variables for classification. The TDRG need less clinical data in classifying while TMHCC need varies clinical factors. Yet, TMHCC covers varies potential predictors of resource use in inpatients' services. Co-operation with electro convulsive therapy, co-morbidity, and age are needed in both TDRG and TMHCC. While TMHCC needed other clinical variables for classification disease cluster subclasses. Cognitive problem was needed for classification in schizophrenia, paranoia and acute psychotic disorders, alcohol use disorders and dependence, dementia and other chronic disturbances of cerebral function. Overactive/aggressive/agitated was needed for classification in schizophrenia, paranoia and acute psychotic disorders, alcohol intoxication and withdrawal. Other mental and behavioural was needed for classification in paranoid and acute psychotic diseases. Depressed mood was needed for classification in major affective, drug use disorders and withdrawal. Suicidal thoudhts or behaviour was needed for classification in Major affective, drug use disorders and withdrawal. Problems making supportive relationships was needed for classification in

alcohol intoxication and withdrawal. Detoxication was needed for classification in alcohol intoxication and withdrawal. Problems with physical illness or disability was needed for classification in drug use disorders and withdrawal, and dementia and other chronic disturbances of cerebral function.

Table 52 Essential variables in each DC by TDRG and TMHCC

Diagnostic class	Predictors of resource use	TDRG	TMHCC
Mental health diseases and disorders			
- Schizophrenia	• co-operation with ECT	✓	✗
	• co-morbidity and age	✓	✓
	• cognitive problem	✗	✓
	• overactive/aggressive/agitated	✗	✓
- Paranoid and acute psychotic diseases	• co-operation with ECT	✓	✗
	• co-morbidity and age	✓	✓
	• other mental & behavioural	✗	✓
	• overactive/aggressive/agitated	✗	✓
- Major affective	• co-operation with ECT	✓	✗
	• co-morbidity and age	✓	✓
	• depressed mood	✗	✓
	• suicidal thoudhts or behaviour	✗	✓
- Anxiety disorders	• co-morbidity and age	✓	✓
- Eating disorders	• co-morbidity and age	✓	✓
- Obsessive compulsive disorders	• co-morbidity and age	✓	✓
- Personality disorders	• co-morbidity and age	✓	✓
- Stress and adjustment disorders	• co-morbidity and age	✓	✓
- Child and adolescent mental disorders	• co-morbidity and age	✓	✓

Table 52 (Cont.)

Diagnostic class	Predictors of resource use	TDRG	TDRG
Alcohol/drug use & alcohol/drug induced organic mental disorders			
- alcohol intoxication and withdrawal	• co-morbidity and age	✓	✓
	• problems making supportive relationships	✗	✓
	• overactive/aggressive/agitated	✗	✓
	• detoxication	✗	✓
- drug use disorders and withdrawal	• co-morbidity and age	✓	✓
	• problems with physical illness or disability	✗	✓
	• suicidal thoughts or behaviour	✗	✓
	• depressed mood	✗	✓
- alcohol use disorders and dependence	• co-morbidity and age	✓	✓
	• cognitive problems	✗	✓
- opioid use disorders and dependence	• co-morbidity and age	✓	✓
- other drug use disorders and intoxication	• co-morbidity and age	✓	✓
Diseases and disorders of the nervous system			
- dementia and other chronic disturbances of cerebral function	• co-morbidity and age	✓	✓
	• problems w physical illness or disability	✗	✓
	• cognitive problems	✗	✓
- delirium	• co-morbidity and age	✓	✓
- seizure	• co-morbidity and age	✓	✓
- Other disorders of nervous system	• co-morbidity and age	✓	✓

4. Distribution of the subjects

4.1 Thai Diadnosis Related Groups (TDRGs)

Table 53 illustrates all subjects (1,950 inpatients), most of them (37.9%) were classified in TDRG 19510 (chronic psychotic disorders), followed by TDRG 20500 (alcohol intoxication and withdrawal) 20.1%, TDRG 19029 (chronic psychotic disorders with ECT) 9.4%, respectively as see a detail in Table 45.

Table 54 illustrates length of stay (LOS) per case of the subjects by TDRG. In all subjects with LOS more than 25.0 days, the highest LOS per case was found in DRG 19510 (chronic psychotic disease: 31.0 days), followed by DRG 20510 (drug use disease and withdrawal: 28.7 days), DRG 19014 (acute psychotic disorders with ECT: 28.3 days), and DRG 19029 (chronic psychotic disease with ECT: 24.2 days), respectively. In cohorts with LOS per case less than 15.0 days, the lowest LOS per subjects was found in DRG 19540 (acute reaction and psychosocial dysfunction: 2 days), followed by DRG 19530 (other affect and somatoform disorder: 6 days), DRG 20502 (other drug use disorders and intoxication: 8 days), DRG 20550 (other drug use disease and intoxication: 9 days), DRG 19592 (organic disturbance and mental retardation: 9 days), and DRG 19010 (acute psychotic disorders with ECT: 14 days), respectively.

Table 55 illustrations full cost (FC) per case by TDRG that average full cost per case was 17,388 baht. In subjects, the highest FC per case was found in DRG 19014 (acute psychotic disorders with ECT: 14,033 baht), followed by DRG 19529 (organic disturbance and mental retardation: 11,343 baht), DRG 19593 (organic disturbance and mental retardation: 10,886 days), and DRG 20510 (drug use disorders and withdrawal: 10,188 baht), respectively. While DRG 1954 (acute reaction and psychosocial dysfunction) had the lowest average FC per case at 1,527 baht. Followed by DRG 19592 (organic disturbance and mental retardation: 3,848 baht), DRG 20550 (other drug use disorders and intoxication: 4,203 days), and DRG 20530 (drug use disorders and withdrawal: 5,215 baht), respectively. Table 7.4 shows variation of FC, that the subjects' subclass that had CV more than standard (1.0) was 1 subclass with % RIV.

Table 56 shows material cost (MC) of inpatients per case by TDRG. MC of TDRG had 24.15 %RIV and no TDRG with CV more than standard (1.0). The subjects had a median full cost per case at 8,451 baht and a mean at 9,645 baht. The highest MC per case was found in TDRG 10002 (mental health disorder, ongoing type: 27,592 baht), followed by TDRG 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 14,974 baht), TDRG 22120 (drug Intoxication and withdrawal, without problems with physical illness/disability, with suicidal thoughts or behavior: 13,210 baht), TDRG 11220 (schizophrenia, age >50, with moderate-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 12,140 baht), and TDRG 11121 (schizophrenia, age < 51, with mod-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 11,957 baht), respectively. The lowest MC per case was found in TDRG 17000 (personality disorders and acute reactions: 1,527 baht), followed by TDRG 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 4,300 baht), TDRG 32210 (delirium, age <71, without detoxification: 5,104 baht), TDRG 24000 (opioid use disorders and dependence: 5,215 baht), and TDRG 15000 (anxiety disorders: 5,492 baht), respectively.

Table 57 shows drug cost of inpatients per case by TDRG. Drug full cost of TDRG TMHCC had 24.15 %RIV and no TDRG with covariance variation (CV.) more than standard (1.0). The cohorts had a median full cost per admission at 8,451 baht and a mean at 9,645 baht. The highest drug cost per case was found in TDRG 10002 (mental health disorder, ongoing type: 27,592 baht), followed by TDRG 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 14,974 baht), TDRG 22120 (drug intoxication and withdrawal, without problems with physical illness/disability, with suicidal thoughts or behavior: 13,210 baht), TDRG 11220 (schizophrenia, age >50, with moderate-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 12,140 baht), and TDRG 11121 (schizophrenia, age < 51, with mod-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 11,957 baht), respectively. The lowest

drug cost per case was found in TDRG 17000 (personality disorders and acute reactions: 1,527 baht), followed by TDRG 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 4,300 baht), TDRG 32210 (delirium, age <71, without detoxification: 5,104 baht), TDRG 24000 (opioid use disorders and dependence: 5,215 baht), and TDRG 15000 (anxiety disorders: 5,492 baht), respectively.

Table 58 shows relative weight (RW) of inpatients per case by TDRG. RW of TDRG had 24.15 %RIV and no TDRG with CV more than standard (1.0). The subjects had a median RW per case at 8,451 baht and a mean at 9,645 baht. The highest RW per case was founded in TDRG 10002 (mental health disorder, ongoing type: 27,592 baht), followed by TDRG 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 14,974 baht), TDRG 22120 (drug intoxication and withdrawal, without problems with physical illness/disability, with suicidal thoughts or behavior: 13,210 baht), TDRG 11220 (schizophrenia, age >50, with moderate-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 12,140 baht), and TDRG 11121 (schizophrenia, age < 51, with mod-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 11,957 baht), respectively. The lowest RW per case was found in TDRG 17000 (personality disorders and acute reactions: 1,527 baht), followed by TDRG 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 4,300 baht), TDRG 32210 (delirium, age <71, without detoxification: 5,104 baht), TDRG 24000 (opioid use disorders and dependence: 5,215 baht), and TDRG 15000 (anxiety disorders: 5,492 baht), respectively.

Table 53 Distribution of the subjects in each DRG subclass

DRG	Definition	Number	% N
10009		26	1.3
19010	acute psychotic disorders with ECT	38	1.9
19014		3	0.2
19029	chronic psychotic disorders with ECT	184	9.4
19039	major affective disorders with ECT	40	2.1
19500	acute psychotic disorders	84	4.3
19510	chronic psychotic disorders	740	37.9
19512		1	0.1
19520	major affective disorders	92	4.7
19530	other affect and somatoform disorders	3	0.2
19540	acute reaction and psychosocial dysfunction	1	0.1
19550	anxiety disorders	6	0.3
19590	organic disturbance and mental retardation	123	6.3
19592		1	0.1
19593		1	0.1
20500	alcohol intoxication and withdrawal	392	20.1
20502		3	0.2
20510	drug use disorders and withdrawal	66	3.4
20512		1	0.1
20520	alcohol use disorders and dependence	107	5.5
20530	opioid use disorders and dependence	3	0.2
20540	psycho stimulant use disorders and dependence	22	1.1
20550	other drug use disorders and intoxication	2	0.1
26509	Ungroup	11	0.6
	Total	1,950	100.0

Table 54 Length of stay of the subjects in each DRG subclass

DRG	Definition	Median	Mean	SD	Min	Max	CV
10009		19	22.9	14.6	5	67	0.64
19010	acute psychotic disorders with ECT	14	18.2	15.8	4	88	0.86
19014		22	28.3	25.1	7	56	0.89
19029	chronic psychotic disorders with ECT	20	24.2	15.3	2	105	0.63
19039	major affective disorders with ECT	18	20.6	11.4	4	56	0.56
19500	acute psychotic disorders	17	18.9	11.6	1	57	0.61
19510	chronic psychotic disorders	27	31.0	21.1	1	182	0.68
19512		19	19.0	.	19	19	-
19520	major affective disorders	18	19.3	12.9	1	67	0.67
19530	other affect and somatoform disorders	6	10.7	10.8	3	23	1.01
19540	acute reaction and psychosocial dysfunction	2	2.0	.	2	2	-
19550	anxiety disorders	12	10.3	5.9	1	16	0.57
19590	organic disturbance and mental retardation	17	21.4	16.9	1	103	0.79
19592		9	9.0	.	9	9	-
19593		24	24.0	.	24	24	-
20500	alcohol intoxication and withdrawal	19	21.1	12.9	1	104	0.61
20502		8	12.7	12.7	3	27	1.00
20510	drug use disorders and withdrawal	24	28.7	20.5	3	134	0.72
20512		24	24.0	.	24	24	-
20520	alcohol use disorders and dependence	18	19.8	10.3	1	49	0.52
20530	opioid use disorders and dependence	11	11.7	6.0	6	18	0.52
20540	psycho stimulant use disorders and dependence	14	17.4	23.3	3	120	1.34
20550	other drug use disorders and intoxication	9	8.5	7.8	3	14	0.92
26509	Ungroup	22	22.6	11.6	4	43	-
	Total	21	25.0	17.9	1	182	0.72
	%RIV						8.04

Table 55 Full cost of the subjects in each DRG subclass

DRG	Definition	Median	Mean	SD	Min	Max	CV
10009		8,189	8,813	4,953	687	23,764	0.56
19010	acute psychotic disorders with ECT	7,508	9,243	6,053	2,596	33,891	0.65
19014		12,091	14,033	11,288	3,842	26,167	0.80
19029	chronic psychotic disorders with ECT	10,064	11,343	6,067	1,238	40,101	0.53
19039	major affective disorders with ECT	9,979	9,684	4,711	584	23,062	0.49
19500	acute psychotic disorders	7,767	7,912	3,966	564	20,654	0.50
19510	chronic psychotic disorders	9,956	10,872	5,618	603	41,919	0.52
19512		8,741	8,741	.	8,741	8,741	-
19520	major affective disorders	7,724	7,557	4,213	605	22,903	0.56
19530	other affect and somatoform disorders	3,195	6,093	6,622	1,415	13,670	1.09
19540	acute reaction and psychosocial dysfunction	1,527	1,527	.	1,527	1,527	-
19550	anxiety disorders	6,023	5,492	2,371	2,535	7,862	0.43
19590	organic disturbance and mental retardation	7,372	8,458	5,305	727	27,607	0.63
19592		3,848	3,848	.	3,848	3,848	-
19593		10,886	10,886	.	10,886	10,886	-
20500	alcohol intoxication and withdrawal	7,660	8,511	4,127	557	24,388	0.48
20502		6,685	7,745	5,718	2,632	13,920	0.74
20510	drug use disorders and withdrawal	9,420	10,188	5,231	1,491	32,550	0.51
20512		8,140	8,140	.	8,140	8,140	-
20520	alcohol use disorders and dependence	7,601	7,908	3,274	548	18,906	0.41
20530	opioid use disorders and dependence	5,637	5,215	2,530	2,500	7,507	0.49
20540	psycho stimulant use disorders and dependence	7,203	7,708	6,545	1,663	35,859	0.85
20550	other drug use disorders and intoxication	4,647	4,647	4,203	1,675	7,619	0.90
26509	Ungroup	9,829	9,774	4,114	2,550	16,050	-
	Total	8,451	9,645	5,274	548	41,919	0.55
	%RIV						6.45

Table 56 Material cost of the subjects in each DRG subclass

DRG	Definition	Median	Mean	SD	Min	Max	CV
10009		2,797	3,205	1,986	333	9,519	0.62
19010	acute psychotic disorders with ECT	2,269	2,925	2,089	905	11,719	0.71
19014		3,929	4,438	3,607	1,112	8,272	0.81
19029	chronic psychotic disorders with ECT	3,074	3,573	2,058	372	13,615	0.58
19039	major affective disorders with ECT	3,132	3,114	1,612	250	7,893	0.52
19500	acute psychotic disorders	2,612	2,670	1,457	230	7,634	0.55
19510	chronic psychotic disorders	3,400	3,782	2,104	249	16,141	0.56
19512		2,786	2,786	.	2,786	2,786	-
19520	major affective disorders	2,684	2,625	1,563	271	8,511	0.60
19530	other affect and somatoform disorders	967	2,005	2,307	399	4,649	1.15
19540	acute reaction and psychosocial dysfunction	380	380	.	380	380	-
19550	anxiety disorders	1,993	1,822	914	608	2,752	0.50
19590	organic disturbance and mental retardation	2,592	3,098	2,110	314	9,933	0.68
19592		1,268	1,268	.	1,268	1,268	-
19593		3,642	3,642	.	3,642	3,642	-
20500	alcohol intoxication and withdrawal	2,500	2,751	1,417	218	8,964	0.51
20502		1,945	2,225	1,751	631	4,099	0.79
20510	drug use disorders and withdrawal	3,140	3,394	1,891	364	11,693	0.56
20512		2,604	2,604	.	2,604	2,604	-
20520	alcohol use disorders and dependence	2,487	2,548	1,112	214	5,526	0.44
20530	opioid use disorders and dependence	1,738	1,643	847	752	2,439	0.52
20540	psycho stimulant use disorders and dependence	2,087	2,321	2,451	403	13,015	1.06
20550	other drug use disorders and intoxication	1,280	1,280	1,248	397	2,163	0.98
26509	Ungroup	3,415	3,304	1,509	775	5,671	-
	Total	2,799	3,251	1,925	214	16,141	0.59
	%RIV						6.71

Table 57 Drug cost of the subjects in each DRG subclass

DRG	Definition	Median	Mean	SD	Min	Max	CV
10009		2,797	3,205	1,986	333	9,519	0.62
19010	acute psychotic disorders with ECT	2,269	2,925	2,089	905	11,719	0.71
19014		3,929	4,438	3,607	1,112	8,272	0.81
19029	chronic psychotic disorders with ECT	3,074	3,573	2,058	372	13,615	0.58
19039	major affective disorders with ECT	3,132	3,114	1,612	250	7,893	0.52
19500	acute psychotic disorders	2,612	2,670	1,457	230	7,634	0.55
19510	chronic psychotic disorders	3,400	3,782	2,104	249	16,141	0.56
19512		2,786	2,786	.	2,786	2,786	-
19520	major affective disorders	2,684	2,625	1,563	271	8,511	0.60
19530	other affect and somatoform disorders	967	2,005	2,307	399	4,649	1.15
19540	acute reaction and psychosocial dysfunction	380	380	.	380	380	-
19550	anxiety disorders	1,993	1,822	914	608	2,752	0.50
19590	organic disturbance and mental retardation	2,592	3,098	2,110	314	9,933	0.68
19592		1,268	1,268	.	1,268	1,268	-
19593		3,642	3,642	.	3,642	3,642	-
20500	alcohol intoxication and withdrawal	2,500	2,751	1,417	218	8,964	0.51
20502		1,945	2,225	1,751	631	4,099	0.79
20510	drug use disorders and withdrawal	3,140	3,394	1,891	364	11,693	0.56
20512		2,604	2,604	.	2,604	2,604	-
20520	alcohol use disorders and dependence	2,487	2,548	1,112	214	5,526	0.44
20530	opioid use disorders and dependence	1,738	1,643	847	752	2,439	0.52
20540	psycho stimulant use disorders and dependence	2,087	2,321	2,451	403	13,015	1.06
20550	other drug use disorders and intoxication	1,280	1,280	1,248	397	2,163	0.98
26509	ungroup	3,415	3,304	1,509	775	5,671	-
	Total	2,799	3,251	1,925	214	16,141	0.59
	%RIV						6.71

Table 58 Relative weight (RW) of the subjects in each DRG subclass

DRG	Definition	Median	Mean	SD	Min.	Max.	Sum
10009		0.26	0.34	0.22	0.26	1.06	8.95
19010	acute psychotic disorders with ECT	0.53	0.53	-	0.53	0.53	20.27
19014		1.87	1.87	-	1.87	1.87	5.60
19029	chronic psychotic disorders with ECT	1.66	1.66	-	1.66	1.66	305.51
19039	major affective disorders with ECT	4.62	4.62	-	4.62	4.62	184.94
19500	acute psychotic disorders	0.43	0.43	-	0.43	0.43	36.23
19510	chronic psychotic disorders	0.43	0.43	-	0.43	0.43	315.61
19512		0.74	0.74	.	0.74	0.74	0.74
19520	major affective disorders	0.22	0.22	-	0.22	0.22	19.84
19530	other affect and somatoform disorders	0.15	0.15	-	0.15	0.15	0.45
19540	acute reaction and psychosocial dysfunction	0.17	0.17	.	0.17	0.17	0.17
19550	anxiety disorders	0.09	0.09	-	0.09	0.09	0.57
19590	organic disturbance and mental retardation	0.32	0.32	-	0.32	0.32	39.40
19592		0.70	0.70	.	0.70	0.70	0.70
19593		1.06	1.06	.	1.06	1.06	1.06
20500	alcohol intoxication and withdrawal	0.19	0.19	-	0.19	0.19	73.54
20502		0.30	0.30	-	0.30	0.30	0.91
20510	drug use disorders and withdrawal	0.59	0.59	-	0.59	0.59	38.95
20512		0.68	0.68	.	0.68	0.68	0.68
20520	alcohol use disorders and dependence	0.16	0.16	-	0.16	0.16	17.56
20530	opioid use disorders and dependence	0.23	0.23	-	0.23	0.23	0.69
20540	psycho stimulant use disorders and dependence	0.30	0.30	-	0.30	0.30	6.63
20550	other drug use disorders and intoxication	0.19	0.19	-	0.19	0.19	0.39
26509	ungroup	-	0.08	0.27	-	0.91	0.91
	Total	0.43	0.55	0.72	-	4.62	1,080.3

4.2 Thai Mental Health Casemix Classification (TMHCC)

Table 59 illustrated inpatient ratio of the subjects by TMHCC. The highest was found in TMHCS 11111 (schizophrenia, age < 51, without cognitive problem, without problem from overactive/aggressive/agitated behavior: 14.5%), followed by TMHCS 11112 (schizophrenia, age < 51, without cognitive problem, with problem from overactive/aggressive/agitated behavior: 13.2%), TMHCS 11122 (schizophrenia, age < 51, with cognitive problem, with problem from overactive/ aggressive/agitated behavior: 7.9%), TMHCS 21112 (alcohol intoxication and withdrawal, without problems making supportive social relationships, without problem from overactive/aggressive/agitated behavior, with problem drinking/drug taking: 4.6%), and TMHCS 13111 (major affective disorders, without suicidal thoughts or behavior, without depressed mood, without problem making supportive social relationships/melancholia: 3.6), respectively.

From Table 60 length of stay (LOS) by TMHCC had 37.78 %RIV and no TMHCS with CV more than standard (1.0). All of them gave a median LOS at 21 days and a mean of LOS at 25.0 days. Of all, 5 TMHCSs had LOS more than 30 days. The highest LOS per case was found in TMHCS 10002 (mental health disorder, ongoing type: 115.9 days), followed by TMHCS 22120 (drug intoxication and withdrawal, without problems with physical illness/disability, with suicidal thoughts or behavior: 38.3 days), TMHCS 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 36.5 days), TMHCS 11121 (schizophrenia, age < 51, with moderate-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 32.9 days), TMHCS 11220 (schizophrenia, age >50, with moderate-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 32.4 days), and TMHCS 11122 (schizophrenia, age < 51, with moderate-severe cognitive problems, with mod-severe problems from overactive/aggressive/ agitated behavior: 31.2 days), respectively. The remaining 6 TMHCSs had LOS less than 30 days. The lowest FC per admission was found in TMHCS 17000 (personality disorders and acute reactions: 2.0 days), followed by TMHCS 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 8.0), TMHCS 32220 (delirium, age <71, with detoxification: 9.0), TMHCS

15000 (anxiety disorders: 10.3), TMHCS 32210 (delirium, age <71, without detoxification: 11.3 baht), TMHCS 24000 (upload use disorders and dependence: 11.7 baht), TMHCS 25000 (other drug use disorder and dependence: 12.1), TMHCS 31220 (dementia and other chronic disturbances of cerebral function, with out problems with physical illness/disability, with cognitive problems: 13.1 days), respectively.

Table 61 shows FC per case by TMHCC. FC of TMHCC had 21.64 %RIV and no TMHCS with CV more than standard (1.0). The subjects had a median FC per case at 8,451 Thai baht and a mean at 9,645 Thai baht. The highest FC per case was found in TMHCS 10002 (mental health disorder, ongoing type: 27,592 Thai baht), followed by TMHCS 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 14,974 baht), TMHCS 22120 (drug intoxication and withdrawal, without problems with physical illness/disability, with suicidal thoughts or behavior: 13,210 baht), TMHCS 11220 (schizophrenia, age >50, with moderate-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 12,140 baht), and TMHCS 11121 (schizophrenia, age < 51, with mod-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 11,957 baht), respectively. The lowest FC per case was found in TMHCS 17000 (personality disorders and acute reactions: 1,527 baht), followed by TMHCS 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 4,300 baht), TMHCS 32210 (delirium, age <71, without detoxification: 5,104 baht), TMHCS 24000 (opioid use disorders and dependence: 5,215 baht), and TMHCS 15000 (anxiety disorders: 5,492 baht), respectively.

Table 62 shows material cost (MC) of inpatient per admission by TMHCC. MC of TMHCC had 23.91%RIV and no TMHCS with CV more than standard (1.0). The subjects had a median MC per case at 2,799 baht and a mean at 3,251 baht. The highest MC was found in TMHCS 10002 (mental health disorder, ongoing type: 10,246 baht), followed by TMHCS 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 5,037 baht), TMHCS 22120 (drug intoxication and

withdrawal, without problems with physical illness/disability, with suicidal thoughts or behavior: 4,553 baht), TMHCS 31120 (dementia and other chronic disturbances of cerebral function, without problems without physical illness/disability, with cognitive problems: 4,367 baht), and TMHCS 11121 (schizophrenia, age < 51, with mod-severe cognitive problems, with no-mild problems from overactive/aggressive/agitated behavior: 4,141 baht), respectively. The lowest MC was founded in TMHCS 17000 (personality disorders and acute reactions: 380 baht), followed by TMHCS 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 1,288 baht), TMHCS 24000 (opioid use disorders and dependence: 1,643 baht), TMHCS 25000 (other drug use disorder and dependence: 1,765 baht), and TMHCS 32210 (delirium, age <71, without detoxification: 1,775 baht), respectively.

Table 63 shows drug cost of inpatients per case by TMHCC. Drug cost of inpatients per admission by TMHCC had 33.04% RIV and no TMHCS with CV more than standard (1.0). The subjects had a median drug cost per case at 278 baht and a mean at 355 baht. The highest drug cost per case was founded in TMHCS 10002 (mental health disorder, ongoing type: 1,263 baht), followed by TMHCS 31120 (dementia and other chronic disturbances of cerebral function, without problems without physical illness/disability, with cognitive problems: 1,010 Thai baht), TMHCS 40000 (other disorders of nervous system: 759 baht), TMHCS 13210 (major affective disorders, with suicidal thoughts or behavior, without depressed mood: 719 baht), and TMHCS 16000 (eating and obsessive-compulsive disorders: 685 baht), respectively. The lowest drug cost per case was founded in TMHCS 17000 (personality disorders and acute reactions: 26 baht), followed by TMHCS 22210 (drug intoxication and withdrawal, with problems with physical illness/disability, without suicidal thoughts or behavior: 54 baht), TMHCS 25000 (other drug use disorder and dependence: 80 baht), TMHCS 24000 (opioid use disorders and dependence: 82 baht), and TMHCS 32220 (delirium, age <71, with detoxification: 83 baht), respectively.

Table 59 Distribution of the subjects in each TMHCC subclass

	TMHCS	Definition	% N
1	1000	Mental Health dis, Same-day type	-
2	2000	Mental Health dis, Ongoing type	1.18
3	11111	Schiz, Age < 51, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	14.51
4	11112	Schiz, Age < 51, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	13.64
5	11121	Schiz, Age < 51, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	2.92
6	11122	Schiz, Age < 51, w cognitive prob, w prob from overactive/aggressive/agitated behavior	7.95
7	11211	Schiz, Age >50, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	3.13
8	11212	Schiz, Age >50, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	1.69
9	11221	Schiz, Age >50, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	0.67
10	11222	Schiz, Age >50, w cognitive prob, w prob from overactive/aggressive/agitated behavior	0.87
11	12110	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	1.33
12	12120	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	0.72
13	12210	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	1.13
14	12220	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	1.38
15	13110	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, wo prob making supportive social relationships / melancholia	6.62
16	13120	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, w prob making supportive social relationships / melancholia	0.92
17	13210	Major affective dis, wo suicidal thoughts or behavior, w depressed mood	0.41
18	13220	Major affective dis, w suicidal thoughts or behavior, wo depressed mood	1.64
19	14000	Other affective & somatoform disorders	0.56
20	15000	Anxiety disorders	0.31
21	16000	Eating & Obsessive-Compulsive disorders	1.38
22	17000	Personality Disorders and Acute Reactions	0.05
23	18000	Childhood and adolescent disorders	-
24	21111	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	3.28
25	21112	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	4.62
26	21121	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	0.62

Table 59 (Cont.)

	TMHCS	Definition	% N
27	21122	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	2.87
28	21211	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	0.36
29	21212	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	1.13
30	21221	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	0.46
31	21222	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	3.23
32	22111	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, wo depressed mood	2.82
33	22112	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, w depressed mood	0.10
34	22120	Drug Intox & withdrawal , wo problems with physical illness/disability, w suicidal thoughts or behavior	0.15
35	22200	Drug Intox & withdrawal , w problems with physical illness/disability	0.15
36	23110	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	3.49
37	23120	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	0.15
38	23210	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	1.74
39	23220	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	0.05
40	24000	Opioid use disorders and dependence	0.15
41	25000	Other drug use disorder and dependence	1.18
42	31110	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, wo cognitive problems	1.64
43	31120	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, w cognitive problems	1.03
44	31210	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, wo cognitive problems	0.31
45	31220	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, w cognitive problems	0.46
46	32110	Delirium, age <71, wo detoxification	2.51
47	32120	Delirium, age <71, w detoxification	3.38
48	32210	Delirium, age > 70, wo detoxification	0.21
49	32220	Delirium, age > 70, w detoxification	0.05

Table 59 (Cont.)

	TMHCS	Definition	% N
50	33000	Seizure	-
51	34000	Other disorders of nervous system	0.82
		Total	100

Table 60 Length of stay of the subjects in each TMHCC subclass

(%RIV=37.78)

THMCS	Definition	Median	Mean	SD	CV
1000	Mental Health dis, Same-day type	-	-	-	
2000	Mental Health dis, Ongoing type	106	115.9	24.2	0.21
11111	Schiz, Age < 51, wo cognitive prob, wo prob from overactive/aggressive/ agitated behavior	25	26.3	15.6	0.59
11112	Schiz, Age < 51, wo cognitive prob, w prob from overactive/aggressive/ agitated behavior	24	28.6	16.2	0.57
11121	Schiz, Age < 51, w cognitive prob, wo prob from overactive/aggressive/ agitated behavior	32	33.0	18.2	0.55
11122	Schiz, Age < 51, w cognitive prob, w prob from overactive/aggressive/ agitated behavior	27	31.2	17.1	0.55
11211	Schiz, Age >50, wo cognitive prob, wo prob from overactive/aggressive/ agitated behavior	21	24.4	12.5	0.51
11212	Schiz, Age >50, wo cognitive prob, w prob from overactive/aggressive/ agitated behavior	21	22.5	10.1	0.45
11221	Schiz, Age >50, w cognitive prob, wo prob from overactive/aggressive/ agitated behavior	27	26.7	8.4	0.31
11222	Schiz, Age >50, w cognitive prob, w prob from overactive/aggressive/ agitated behavior	28	32.4	18.7	0.58
12110	Paranoid & acute psychotic dis, wo prob overactive/ aggressive/ disruptive or agitated behavior, wo other mental & behavioral prob	17	18.2	10.8	0.59
12120	Paranoid & acute psychotic dis, wo prob overactive/ aggressive/ disruptive or agitated behavior, w other mental & behavioral prob	18.5	20.1	12.9	0.64
12210	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	13	14.1	10.3	0.73
12220	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	14	16.8	8.9	0.53
13110	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, wo prob making supportive social relationships / melancholia	18	21.1	13.2	0.63
13120	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, w prob making supportive social relationships / melancholia	12.5	16.7	13.5	0.81
13210	Major affective dis, wo suicidal thoughts or behavior, w depressed mood	34	36.5	19.2	0.53

Table 60 (Cont.)

(%RIV=37.78)

Code	T-MHCS	Median	Mean	SD	CV
13220	Major affective dis, w suicidal thoughts or behavior, wo depressed mood	17	18.0	12.2	0.68
14000	Other affective & somatoform disorders	21	21.5	11.2	0.52
15000	Anxiety disorders	11.5	10.3	5.9	0.57
16000	Eating & Obsessive-Compulsive disorders	19	23.8	14.4	0.61
17000	Personality Disorders and Acute Reactions	2	2.0	.	-
18000	Childhood and adolescent disorders				
21111	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	17	17.6	9.1	0.52
21112	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	20	21.5	11.3	0.53
21121	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	16.5	16.8	6.4	0.38
21122	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	19.5	20.5	10.3	0.50
21211	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/ agitated behavior, wo Detoxication	17	22.9	15.9	0.69
21212	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/ agitated behavior, w Detoxication	18.5	18.8	11.4	0.60
21221	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/ agitated behavior, wo Detoxication	29	28.9	20.2	0.70
21222	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/ agitated behavior, w Detoxication	20	23.9	16.0	0.67
22111	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, wo depressed mood	23	24.5	10.4	0.42
22112	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, w depressed mood	32.5	32.5	16.3	0.50
22120	Drug Intox & withdrawal , wo problems with physical illness/disability, w suicidal thoughts or behavior	43	38.3	9.0	0.23
22200	Drug Intox & withdrawal , w problems with physical illness/disability	8	8.0	5.0	0.63
23110	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	16	17.9	10.1	0.56
23120	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	24	26.0	11.1	0.43
23210	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	19.5	22.0	10.2	0.46
23220	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	22	22.0	.	-
24000	Opioid use disorders and dependence	11	11.7	6.0	0.52
25000	Other drug use disorder and dependence	14	12.1	4.7	0.39

Table 60 (Cont.)

(%RIV=37.78)

Code	T-MHCS	Median	Mean	SD	CV
31110	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, wo cognitive problems	16	20.0	13.6	0.68
31120	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, w cognitive problems	32.5	31.4	18.9	0.60
31210	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, wo cognitive problems	11.5	17.2	15.0	0.87
31220	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, w cognitive problems	14	14.0	6.9	0.49
32110	Delirium, age <71, wo detoxification	15	18.2	13.3	0.73
32120	Delirium, age <71, w detoxification	18	20.9	12.4	0.59
32210	Delirium, age > 70, wo detoxification	4.5	6.3	4.6	0.73
32220	Delirium, age > 70, w detoxification	9	9.0	.	-
33000	Seizure				
34000	Other disorders of nervous system	24.5	25.3	14.2	0.56
	Total	21	25.0	17.9	0.72

Table 61 Full cost of the subjects in each TMHCC subclass

(%RIV = 21.64)

Code	TMHCS	Median	Mean	SD	CV
1000	Mental Health dis, Same-day type	-	-	-	-
2000	Mental Health dis, Ongoing type	28,210	27,592	7,287	0.26
11111	Schiz, Age < 51, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	9,636	9,887	4,942	0.50
11112	Schiz, Age < 51, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	9,927	11,114	5,244	0.47
11121	Schiz, Age < 51, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	11,865	11,957	5,662	0.47
11122	Schiz, Age < 51, w cognitive prob, w prob from overactive/aggressive/agitated behavior	10,223	11,808	5,498	0.47
11211	Schiz, Age >50, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	8,452	8,989	3,922	0.44
11212	Schiz, Age >50, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	8,085	8,904	3,554	0.40
11221	Schiz, Age >50, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	10,064	9,780	2,705	0.28
11222	Schiz, Age >50, w cognitive prob, w prob from overactive/aggressive/agitated behavior	9,671	12,140	7,494	0.62
12110	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	7,730	7,960	3,574	0.45

Table 61 (Cont.)

(%RIV = 21.64)

Code	TMHCS	Median	Mean	SD	CV
12120	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	9,655	9,168	4,510	0.49
12210	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	6,554	6,361	3,630	0.57
12220	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	7,137	8,123	2,827	0.35
13110	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, wo prob making supportive social relationships / melancholia	8,069	8,781	4,849	0.55
13120	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, w prob making supportive social relationships / melancholia	6,861	7,361	4,971	0.68
13210	Major affective dis, wo suicidal thoughts or behavior, w depressed mood	13,365	14,974	8,105	0.54
13220	Major affective dis, w suicidal thoughts or behavior, wo depressed mood	7,811	7,779	4,419	0.57
14000	Other affective & somatoform disorders	10,946	9,371	4,182	0.45
15000	Anxiety disorders	6,023	5,492	2,371	0.43
16000	Eating & Obsessive-Compulsive disorders	8,490	9,101	4,935	0.54
17000	Personality Disorders and Acute Reactions	1,527	1,527	.	-
18000	Childhood and adolescent disorders				
21111	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	7,564	7,120	2,997	0.42
21112	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	7,628	8,276	3,407	0.41
21121	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	5,967	7,202	2,747	0.38
21122	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	7,988	8,329	3,871	0.46
21211	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	7,537	9,852	6,197	0.63
21212	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	7,466	7,989	4,223	0.53
21221	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	13,190	10,872	5,574	0.51
21222	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	8,732	9,401	4,634	0.49
22111	Drug intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, wo depressed mood	9,052	9,132	3,488	0.38
22112	Drug intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, w depressed mood	12,869	12,869	7,473	0.58
22120	Drug intox & withdrawal , wo problems with physical illness/disability, w suicidal thoughts or behavior	14,986	13,210	3,290	0.25
22200	Drug intox & withdrawal , w problems with physical illness/disability	5,652	4,300	2,433	0.57
23110	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	7,199	7,157	3,257	0.46

Table 61 (Cont.)

(%RIV = 21.64)

Code	TMHCS	Median	Mean	SD	CV
23120	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	9,421	11,034	4,534	0.41
23210	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	8,178	9,011	2,941	0.33
23220	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	9,733	9,733	.	-
24000	Opioid use disorders and dependence	5,637	5,215	2,530	0.49
25000	Other drug use disorder and dependence	7,007	6,218	2,050	0.33
31110	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, wo cognitive problems	6,953	8,117	4,834	0.60
31120	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, w cognitive problems	11,320	11,690	6,205	0.53
31210	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, wo cognitive problems	6,317	7,165	5,379	0.75
31220	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, w cognitive problems	6,060	6,930	2,809	0.41
32110	Delirium, age <71, wo detoxification	6,361	7,727	4,913	0.64
32120	Delirium, age <71, w detoxification	8,174	9,310	4,631	0.50
32210	Delirium, age > 70, wo detoxification	2,337	2,959	2,482	0.84
32220	Delirium, age > 70, w detoxification	7,215	7,215	.	-
33000	Seizure				
34000	Other disorders of nervous system	9,212	9,027	3,935	0.44
	Total	8,451	9,645	5,274	0.55

Table 62 Material cost of the subjects in each TMHCC subclass

(%RIV = 23.91)

TMHCS	Definition	Median	Mean	SD	CV
1000	Mental Health dis, Same-day type				
2000	Mental Health dis, Ongoing type	10,409	10,246	2,632	0.26
11111	Schiz, Age < 51, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	3,340	3,370	1,803	0.54
11112	Schiz, Age < 51, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	3,318	3,754	1,914	0.51
11121	Schiz, Age < 51, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	4,082	4,141	2,047	0.49
11122	Schiz, Age < 51, w cognitive prob, w prob from overactive/aggressive/agitated behavior	3,459	4,013	1,976	0.49
11211	Schiz, Age >50, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	2,745	3,067	1,461	0.48
11212	Schiz, Age >50, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	2,687	2,947	1,205	0.41
11221	Schiz, Age >50, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	3,444	3,362	981	0.29
11222	Schiz, Age >50, w cognitive prob, w prob from overactive/aggressive/agitated behavior	3,381	4,125	2,466	0.60
12110	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	2,600	2,621	1,314	0.50
12120	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	2,981	2,981	1,572	0.53
12210	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioral prob	1,988	2,098	1,277	0.61
12220	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioral prob	2,150	2,556	990	0.39
13110	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, wo prob making supportive social relationships / melancholia	2,757	2,964	1,705	0.58
13120	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, w prob making supportive social relationships / melancholia	2,144	2,484	1,812	0.73
13210	Major affective dis, wo suicidal thoughts or behavior, w depressed mood	4,635	5,037	2,619	0.52
13220	Major affective dis, w suicidal thoughts or behavior, wo depressed mood	2,520	2,611	1,626	0.62
14000	Other affective & somatoform disorders	3,571	3,162	1,463	0.46
15000	Anxiety disorders	1,993	1,822	914	0.50
16000	Eating & Obsessive-Compulsive disorders	3,069	3,335	1,989	0.60
17000	Personality Disorders and Acute Reactions	380	380	.	-
18000	Childhood and adolescent disorders				
21111	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	2,496	2,315	1,057	0.46
21112	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	2,508	2,754	1,225	0.44

Table 62 (Cont.)

(%RIV = 23.91)

TMHCS	Definition	Median	Mean	SD	CV
21121	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	1,832	2,332	964	0.41
21122	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	2,551	2,685	1,221	0.45
21211	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	2,469	3,090	1,925	0.62
21212	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	2,474	2,488	1,379	0.55
21221	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	4,359	3,610	2,089	0.58
21222	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	2,551	3,064	1,696	0.55
22111	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, wo depressed mood	3,067	3,004	1,209	0.40
22112	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, w depressed mood	4,229	4,229	2,484	0.59
22120	Drug Intox & withdrawal , wo problems with physical illness/disability, w suicidal thoughts or behavior	5,230	4,553	1,203	0.26
22200	Drug Intox & withdrawal , w problems with physical illness/disability	1,747	1,288	800	0.62
23110	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	2,203	2,281	1,055	0.46
23120	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	3,184	3,893	1,891	0.49
23210	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	2,589	2,919	1,075	0.37
23220	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	3,232	3,232	.	-
24000	Opioid use disorders and dependence	1,738	1,643	847	0.52
25000	Other drug use disorder and dependence	2,066	1,765	618	0.35
31110	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, wo cognitive problems	2,360	2,971	1,894	0.64
31120	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, w cognitive problems	4,424	4,472	2,513	0.56
31210	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, wo cognitive problems	2,143	2,640	2,143	0.81
31220	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, w cognitive problems	2,161	2,368	1,023	0.43
32110	Delirium, age <71, wo detoxification	2,212	2,695	1,825	0.68
32120	Delirium, age <71, w detoxification	2,627	2,903	1,496	0.52
32210	Delirium, age > 70, wo detoxification	717	986	849	0.86
32220	Delirium, age > 70, w detoxification	2,063	2,063	.	-

Table 62 (Cont.)

(%RIV = 23.91)

TMHCS	Definition	Median	Mean	SD	CV
33000	Seizure				
34000	Other disorders of nervous system	3,027	3,122	1,505	0.48
	Total	2,799	3,251	1,925	0.59

Table 63 Drug cost of the subjects in each TMHCC subclass

(%RIV=33.04)

TMHCC	Definition	Median	Mean	SD	CV
1000	Mental Health dis, Same-day type				
2000	Mental Health dis, Ongoing type	1,229	1,263	445	0.35
11111	Schiz, Age < 51, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	336	371	224	0.60
11112	Schiz, Age < 51, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	336	404	236	0.58
11121	Schiz, Age < 51, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	454	468	259	0.55
11122	Schiz, Age < 51, w cognitive prob, w prob from overactive/aggressive/agitated behavior	395	446	252	0.56
11211	Schiz, Age >50, wo cognitive prob, wo prob from overactive/aggressive/agitated behavior	307	354	234	0.66
11212	Schiz, Age >50, wo cognitive prob, w prob from overactive/aggressive/agitated behavior	293	314	147	0.47
11221	Schiz, Age >50, w cognitive prob, wo prob from overactive/aggressive/agitated behavior	395	367	126	0.34
11222	Schiz, Age >50, w cognitive prob, w prob from overactive/aggressive/agitated behavior	410	450	275	0.61
12110	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioural prob	249	264	159	0.60
12120	Paranoid & acute psychotic dis, wo prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioural prob	271	298	185	0.62
12210	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, wo other mental & behavioural prob	183	203	152	0.75
12220	Paranoid & acute psychotic dis, w prob overactive/aggressive/disruptive or agitated behavior, w other mental & behavioural prob	205	246	128	0.52
13110	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, wo prob making supportive social relationships / melancholia	340	418	268	0.64
13120	Major affective dis, wo suicidal thoughts or behavior, wo depressed mood, w prob making supportive social relationships / melancholia	266	348	285	0.82
13210	Major affective dis, wo suicidal thoughts or behavior, w depressed mood	701	719	354	0.49
13220	Major affective dis, w suicidal thoughts or behavior, wo depressed mood	329	362	264	0.73

Table 63 (Cont.)

(%RIV=33.04)

TMHCC	Definition	Median	Mean	SD	CV
14000	Other affective & somatoform disorders	307	344	168	0.49
15000	Anxiety disorders	304	273	156	0.57
16000	Eating & Obsessive-Compulsive disorders	500	685	557	0.81
17000	Personality Disorders and Acute Reactions	26	26	.	-
18000	Childhood and adolescent disorders				
21111	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	157	160	92	0.57
21112	Alc intox & withdrawal, wo problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	184	194	102	0.53
21121	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	129	167	92	0.55
21122	Alc intox & withdrawal, wo problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	180	186	93	0.50
21211	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, wo Detoxication	157	205	141	0.69
21212	Alc intox & withdrawal, w problems making supportive social relationships, wo prob from overactive/aggressive/agitated behavior, w Detoxication	170	164	106	0.64
21221	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, wo Detoxication	293	278	184	0.66
21222	Alc intox & withdrawal, w problems making supportive social relationships, w prob from overactive/aggressive/agitated behavior, w Detoxication	184	215	148	0.69
22111	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, wo depressed mood	162	173	80	0.46
22112	Drug Intox & withdrawal , wo problems with physical illness/disability, wo suicidal thoughts or behavior, w depressed mood	229	229	114	0.50
22120	Drug Intox & withdrawal , wo problems with physical illness/disability, w suicidal thoughts or behavior	303	270	63	0.23
22200	Drug Intox & withdrawal , w problems with physical illness/disability	56	54	39	0.72
23110	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	129	150	80	0.53
23120	Alc/drug use & alc/drug induced organic mental dis., wo cognitive problems, age < 56, wo depressed mood	221	575	678	1.18
23210	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	175	201	94	0.47
23220	Alc/drug use & alc/drug induced organic mental dis., w cognitive problems, age > 55, wo depressed mood	203	203	.	-
24000	Opioid use disorders and dependence	77	82	42	0.52
25000	Other drug use disorder and dependence	99	80	30	0.37
31110	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, wo cognitive problems	500	653	481	0.74
31120	Dementia and other chronic disturbances of cerebral function, wo physical illness/disability, w cognitive problems	946	1,034	681	0.66

Table 63 (Cont.)

(%RIV=33.04)

TMHCC	Definition	Median	Mean	SD	CV
31210	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, wo cognitive problems	410	601	530	0.88
31220	Dementia and other chronic disturbances of cerebral function, w physical illness/disability, w cognitive problems	500	480	228	0.47
32110	Delirium, age <71, wo detoxification	393	499	452	0.91
32120	Delirium, age <71, w detoxification	175	201	129	0.64
32210	Delirium, age > 70, wo detoxification	143	214	170	0.79
32220	Delirium, age > 70, w detoxification	83	83	.	-
33000	Seizure				
34000	Other disorders of nervous system	356	358	199	0.55
	Total	278	355	297	0.84

5. Experts' opinion

Experts believed that using mental health casemix separately from other diseases is better in vary aspects. **First**, the casemix model may be used to develop cost benchmark information, enabling provided service to make comparisons with other hospitals on costs and treatment days for similar cases. This can have an influence on practice, and by itself, strengthen the differentiation of care patterns provided to different patient types. **Second**, the classification provides a base for the development of clinical protocols, in terms of establishing a framework for determining what package of services each group should receive. **Third**, the utility of the classification for funding will need to be assessed by a funder and a provider, taking account of the adequacy of their existing approaches for funding. In its current form, the classification is likely to be useful as a management and clinical information tool that can inform funding decisions by providing data of receiver of mental health resources. **Fourth**, a longer term monitoring of clinical attributes will assist in determining the outcome of treatment interventions. Several of the measurement instruments upon which the classification is based were designed

explicitly to monitor change over time. Fifth, involving parties especially services hospital may wish to collect the data to monitor the quality of services over time.

Most of our experts' opinion mainly agreed that TMHCC had advantages over TDRG for mental health. They believed TMHCC could support the Thai national mental health service systems in at less two ways. First, it might allocate more appropriate and equitable budget allocation to all inpatients on severity level. Patient with high severity of symptom should receive more budget than that with less severity. Consequently, conflicts among related parties (e.g. funder, service provider, and patient) might be diminished. Second, using mental health measurement in routine practice should improve service quality for inpatient. By this way, scores from measurement provided data for casemix grouping and service outcome evaluating.

However, all parties especially experts from medical schools were likely to be cautious of immediate use of the classification for funding purposes because of the comparatively heavy load from scoring mental health measurement when compared with TDRG. However, this will depend on whether they regard the current historical or input based funding systems as preferable. Additionally, develop clinical protocols or pathways should fund alongside with professional support. The service utilization patterns for the mental health patient are a valuable resource in identifying the type, level, and cost of service over the period of the study. The experts could compare this with what is regarded as appropriate practice. The study was aided through the participation of many clinicians, both formally through their membership of the consultant committee, or the clinical panels convened during the planning stages, and through more informal channels

6. Comparing of statistic performance in each model

Statistic performance in each classification models in this study considering on 3 main aspects; maximun reduction in variance (RIV), minimun coefficients of variations (CVs), and maximun subclass.

Table 64 illustrates comparing results of statistic performance between TDRG and TMHCC. TDRG model had 4 MDCs or 18 DCs or 57 DRG subclasses with 29 DRG subclasses fill in. While TMHCC model had 4 MDCs or 18 DCs or 51 TMHCSs with 49 TMHCSs fill in. In the aspect of length of stay per case, TDRG had 7.84% RIV and had 3 TMHCSs that had CV more than 1.0, while TDRG had 40.01% RIV and had no TDRG subclass that had CV more than 1.0. Comparing in the view of total cost per case, TDRG had 6.15% RIV and had 1 TMHCSs that had CV more than 1.0, while TMHCC had 21.15% RIV and had no TDRG subclass that had CV more than 1.0. Comparing in the view of material cost per case, TDRG had 6.43% RIV and had 2 TMHCSs that had CV more than 1.0, while TMHCC had 26.25% RIV and had no TDRG subclass that had CV more than 1.0.

Table 64 Comparing of statistic performance between TDRG and TMHCC

		TDRG	TMHCC
1.	Total subclass in model	49	51
2.	Total subclass in model that had subjects filled in	24	48
3.	Length of stay per admission		
	- % of Reduction in variance (RIV)	7.84	40.01
	- number of subclass that have CV > 1.0	3	0
4.	Full cost per admission		
	- % of Reduction in variance (RIV)	6.15	21.15
	- number of subclass that have CV > 1.0	1	0
5.	Material cost per admission		
	- % of Reduction in variance (RIV)	6.43	26.25
	- number of subclass that have CV > 1.0	2	0

7. Comparing of expert opinions toward each model

Develop clinical protocols or pathways should fund alongside with professional support. The service utilization patterns for the mental health patient are a valuable resource in identifying the type, level, and cost of service over the period of the study. The experts could compare this with what is regarded as appropriate practice. The study was aided through the participation of many clinicians, both formally through their membership of the consultant committee, or the clinical panels convened during the planning stages, and through more informal channels.

Refinement of the patient measurement instruments the majority of the measure used in the study classification are captured by rating instruments developed in the studies. Initiatives to improve the measures should be aimed at building a set of broad, multi-purpose instruments that serve both outcome and casemix purposes. The T-HoNOS is a deceptively simple instrument, underpinned by complex logic. The study experience emphasised the need for training as a precondition to use of the Thai T-HoNOS and a process for ongoing data quality control.

While the adoption of the classification is ultimately a decision for fund provider of mental health services, two issues should be considered in reaching a final judgment.

The first issue regarding the purposes of a casemix classification becomes synonymous with funding models for health services in Thailand. In deciding whether the TMHCC should be pursued, the range of uses of the model by funders, service providers, and patients should be assessed. These include:

1. **Costing and benchmark:** The TMHCC may be used to develop cost benchmark information, enabling provided service to make comparisons with other hospitals on costs and treatment days for similar cases. This can have an influence on practice, and by itself, strengthen the differentiation of care patterns provided to different patient types.

2. **Clinical protocols:** The classification provides a base for the development of clinical protocols, in terms of establishing a framework for determining what package of services each group should receive.

3. **Funding purposes:** The utility of the classification for funding will need to be assessed by a funder and a provider, taking account of the adequacy of their existing approaches for funding. In its current form, the classification is likely to be useful as a management and clinical information tool that can inform funding decisions by providing data of receiver of mental health resources

4. **Outcome measurement:** A longer term monitoring of clinical attributes will assist in determining the outcome of treatment interventions. Several of the measurement instruments upon which the classification is based were designed explicitly to monitor change over time.

5. **Quality management:** Involving parties especially services hospital may wish to collect the data to monitor the quality of services over time.

The second issue for consideration concerning the alternatives to the TMHCC classification. From panel expert meeting, all parties especially experts from medical school were likely to be cautious of immediate use of the classification for funding purposes because of the comparatively heavy load from scoring mental health measurement when compared with TDRG. However, this will depend on whether they regard the current historical or input based funding systems as preferable.

In the subjects, TMHCC classification mainly used inpatient characteristics to classify e.g., diagnosis, age, severity of symptom, level of functioning while TDRG classification used only diagnosis and procedures. Therefore, TMHCC classification is likely to be better off than TDRG classification in term of model structure.

The percentage of RIV and CV provided by TMHCC method from our subjects are also better than that given by DRG method. This shows TMHCC classification used in the two psychiatric hospitals is more efficient and clinical compatible in each subclass than DRG method.

According to our experts' opinion, most mainly agreed that TMHCC classification has advantages over TDRG mental health classification because of its capacity to explain inpatient cost variation e.g. clinical severity and level of functioning.

Experts believed TMHCC could support Thai national mental health systems by

1. allocating more appropriate and equitable budget allocation to all inpatients on severity level. In general, patient with high severity of symptom should receive more budget than that with less severity. Consequently, conflicts among related parties (e.g. funder, service provider, and service receiver) might be diminished.

2. using mental health measurement in routine practice to support service quality for inpatient. By this way, scores from measurement provided data for casemix grouping and service outcome evaluating.

8. Discussion and conclusions

Classification development, refinement and implementation are iterative processes. The above list is clearly not exhaustive, and other possibilities will emerge as the mental health service sector gains experience in this area. The TMHCC classification offers a potential base for many future developments in the mental health sector.

Thai uses relative weight of DRG for payment many years ago and it is believed to be faires system than payment by number of hospitalization or capitation. However, evidences from many studies show DRG is inappropriate for psychiatric inpatients (West, 1989).

This study shows superiorly the new allocation by casemix approach in all aspects. It is not only better in statistic but also support mental health service in the view of quality, strategy, future study, etc.

The new allocation used patient attribution data such as clinical symptom and functioning. However, the new method implementation should not add on cost or labor over existing system. Weighting between benefit and cost is a necessary process to answer the question of how efficient/effective and suitable the payment system is.

Influential factors towards a successful of the implementation of new allocation depend on many parties. If the TMHCC is implemented as a tool for budget allocation, many processes must be needed during pre-implement, implement, and post-implement as similar to other studies (Jacobson, 1998; Cohen, 1989) to protect problem by over-

and under diagnosis and over rating severity and function score for rising reimbursement. All parties (provider, funder, insurance) must cooperate during this period. The preparing phase should consist of training for both mental health measurement use and data collection. The implemention phase should be composed of data collection software for data collection. The post-implementation phase should be composed of maintaining old system during changing period for double check and make back up data. Auditing by consulting the foreign expert cover rating score clinical symptom and data collection.

The knowledge from this study is a preliminary stage of developing policy of budget allocation. But it is only a starting point. Firstly, I should propose my find out to all involving; providers, funders, policy makers.

The Thai public health budget allocation for psychiatric patients needs to utilize economic, public health, etc. to assess system elements and problems. However, problems affecting mental health system development are as follows:

1. Mental health measurement has employed few psychiatric hospitals. Specific measurements for certain conditions are used on a case-by-case basis. Therefore, it is worth exploring how appropriate and how worthy the mental health outcome measurement is (Chansan, 2004, pp. 345-52)

2. Financial database for Thai's public health system is recorded on a cash basis despite many efforts to change it into an accrual basis. This problem makes reporting inconsistent, untimely, and inaccurate (Phuaphanprasert et al, 2003).