

國家衛生研究院研究資源2004系列活動

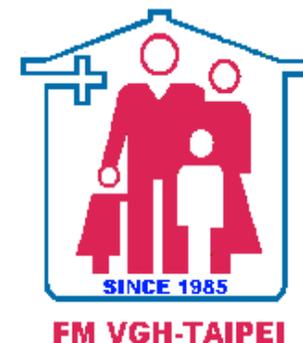
全民健康保險研究資料庫開發與應用研討會

藥品費用研究之應用

陳 曾 基

台北榮民總醫院家庭醫學部

國立陽明大學醫學院



Rx

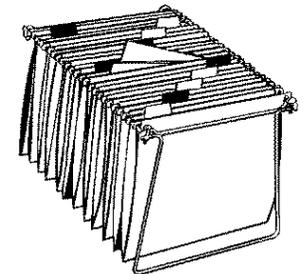
Prologue

- An illustrating example
about drug expenditures
within the NHI in Taiwan

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Data Source

- NHIRD
S_CD20020.DAT



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姓名 NHIRD Workshop

日期 Sept. 3, 2004

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OPD, 1/500 sampling ratio

Hospital Contract Type	Total Drug Amount	Total Amount	Drug Cost Ratio
AMC	46,698,923	99,645,486	46.9%
LCH	18,085,794	62,666,847	28.9%
MH	33,510,790	90,398,978	37.1%
PC	29,398,493	142,625,609	20.6%
Total	127,694,000	395,336,920	32.3%

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Cave

- **Cost**

Rx

In Economics

- Direct cost
- Indirect cost
- Intangible cost

Rx

In Accounting

- Ex-factory cost
- Acquisition cost
- Additional cost
 - 藥事服務費: 0 – 40 NTD / Rx
 - 連續處方箋加給

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Within the NHI

- Bundled cost
 - case payment
 - 簡表
- Claim vs. payment
- Out-of-pocket cost (co-payment)

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Time factor

- Discounting
- Change of drug prices
(benefit schedule)
- Change of denominator
(beneficiaries)

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So, ...

- Please tolerate the ambiguity of cost concept in the medical literature

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Key Concept

- Drug cost is meaningful only in association with prescription patterns

Rx

Today's Case Study

- Patterns and Costs of
Antipsychotic Drug Use
in Taiwan: 1997 to 2001

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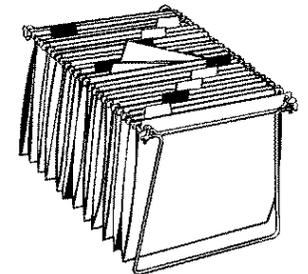
Aim

- To analyze the prevalence, patterns, and cost of antipsychotic use during a recent 5-year period in Taiwan, with an emphasis on atypical antipsychotics

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Data Source

- NHIRD “cohort”
datasets (R01–R04)
- $R\{01..04\}_{\{CD,OO,DD,DO\}\{1997..2001\}.DAT$



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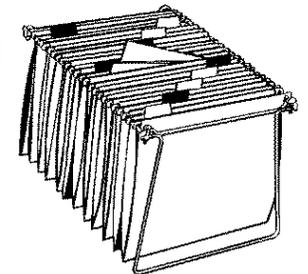
Comment

- Prescribing <> dispensing
 - Drug redemption

R

Dataset Description

- 107,649 admissions
- 5,762,312 inpatient prescription items
- 13,034,393 visits
- 56,672,631 outpatient prescription items



Rx

Comment

- An admission record <> an admission
- An admission prescription record <> an admission prescription
- An ambulatory record <> an outpatient visit

Rx

Antipsychotics

- all drug items of the group N05A in the ATC classification system
- 384 drug items

R ATC Drug Classification

Anatomical

Therapeutic

Chemical

Classification

R ATC Classification System

- **First level:**
 - 14 main organ or system groups
- **Second and third levels:**
 - Therapeutic / pharmacological
- **Forth level:**
 - Therapeutic / pharmacological / chemical
- **Fifth level:**
 - Chemical substance

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Example

- **N** **Nervous system**
(1st level, anatomical main group)
- **N05** **Psycholeptics**
(2nd level, therapeutic main group)
- **N05A** **Antipsychotics**
(3rd level, therapeutic/pharm. group)
- **N05A D** **Butyrophenone derivatives**
(4th level, chem./therap./pharm. group)
- **N05A D01** **Haloperidol**
(5th level, subgroup for chemical substance)

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Comment

- Listed drug item <> available drug item
- A drug item <> a brand

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Antipsychotics Subgrouping

- **N05AA** phenothiazine with aliphatic side-chain
- **N05AB** phenothiazine with piperazine structure
- **N05AC** phenothiazine with piperidine structure
- **N05AD** butyrophenone derivatives
- **N05AE** indole derivatives
- **N05AF** thioxanthene derivatives

R

Antipsychotics Subgrouping

- **N05AG** diphenylbutylpiperidine derivatives
- **N05AH** diazepines, oxazepines and thiazepines
- **N05AK** neuroleptics, in tardive dyskinesia
- **N05AL** benzamides
- **N05AN** lithium
- **N05AX** other antipsychotics

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Atypical Antipsychotics

- sertindole (N05AE03)
- ziprasidone (N05AE04)
- clozapine (N05AH02)
- olanzapine (N05AH03)
- quetiapine (N05AH04)
- remoxipride (N05AL04)
- amisulpride (N05AL05)
- risperidone (N05AX08)
- clotiapine (N05AX09)
- zotepin (N05AX11)
- aripiprazole (no ATC code yet)

28 items

R

Comment

- No official definition of atypical antipsychotics

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Main Measures

- trend in prevalence, prescribed amounts, and cost of antipsychotic use
- stratified by category (conventional vs. atypical) and ingredient (ATC 5th level)
- diagnostic distribution of new users of atypical antipsychotics

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Annual Prevalence

- The denominator for calculating the prevalence in each year included only those who were still insured that year

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Prescribed Amount

- defined daily doses (DDDs)
according to the ATC classification
system
- the number of DDDs per 1000
inhabitants per day

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Comment

- DDD: a unit of measurement
 - <> recommended daily dose
 - <> prescribed daily dose (PDD)

R Diagnostic Distribution

- 5 diagnoses on an admission record and 3 diagnoses on a visit record
- categorized into 4 groups in a hierarchical order according to Hermann et al.

R Diagnostic Distribution

- schizophrenia and other psychotic disorders (293.81, 293.82, 295, 297, 298)
- affective disorders (293.83, 296, 300.4, 301.13, 311)
- other psychiatric disorder (290 to 319, excluding the former 2 groups)
- nonpsychiatric disorder (all except the former 3 groups)

Rx

Comment

- Conversion of A-code

R

Comment

- New user: length of time to review previous drug use retrospectively?

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Data Processing

- Microsoft SQL Server 2000

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Comment

- All roads lead to Rome
- TMTOWTDI (There's more than one way to do it)

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Results

- 200,000-person cohort
- 195,971 ever insured during the 5-year study period
 - 180,781 (in 1997)
 - 183,448 (in 1998)
 - 185,707 (in 1999)
 - 187,237 (in 2000)
 - 183,976 (in 2001)

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Prevalence

- 5-year for antipsychotics: 19.1% (37,441 people)
 - 5.2% (in 1997)
 - 5.7% (in 1998)
 - 6.6% (in 1999)
 - 6.2% (in 2000)
 - 6.1% (in 2001)

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Comment

- Why did so many people have taken antipsychotics?

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Prevalence

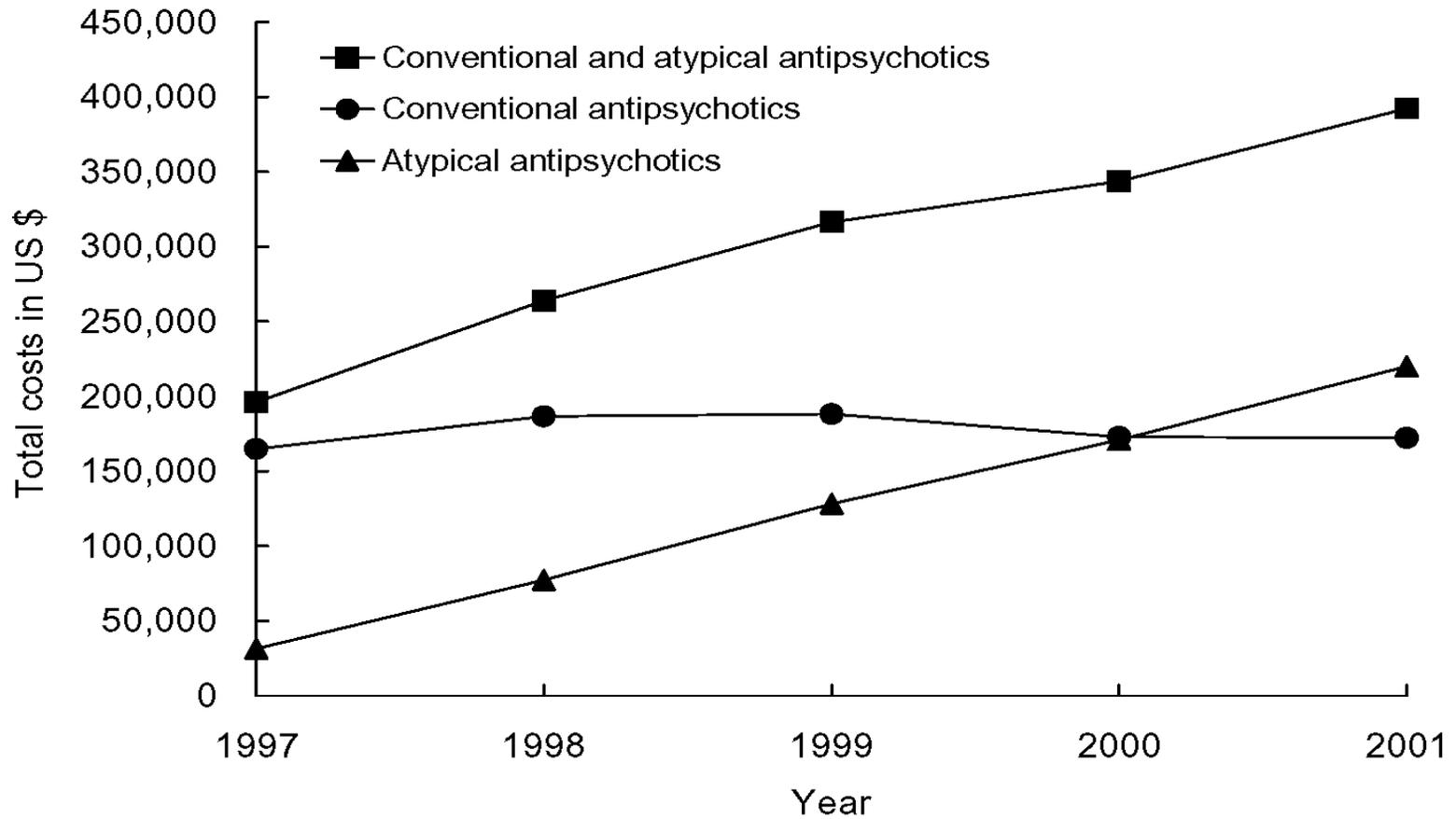
- 5-year for atypical antipsychotics: 0.4% (713 people)
 - 0.1% (in 1997)
 - 0.1% (in 1998)
 - 0.1% (in 1999)
 - 0.2% (in 2000)
 - 0.3% (in 2001)

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Comment

- Confidence interval?

Trend in antipsychotic drug costs among the 200,000-person cohort in Taiwan



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Prescribed amount (DDD/1000 inhabitants/day)

Year	Antipsychotics	Atypical	Conventional
1997	4.2	0.2	4
1998	4.3	0.3	3.9
1999	4.1	0.5	3.6
2000	4.0	0.6	3.4
2001	4.3	0.8	3.5

Table 1. Distribution of antipsychotic drug use by 183,976 persons in 2001

Ingredient	ATC code	No. of items	No. of recipients	No. of DDDs	Total cost in US \$
Chlorpromazine	N05AA01	18	453	13,284	2,083
Levomepromazine	N05AA02	3	8	50	56
Fluphenazine	N05AB02	6	34	8,490	1,239
Perphenazine	N05AB03	6	81	640	323
Prochlorperazine	N05AB04	16	7,100	8,442	3,662
Trifluoperazine	N05AB06	9	119	11,918	2,371
Thioridazine	N05AC02	15	165	6,354	3,891
Pipotiazine	N05AC04	1	26	1,325	925
Haloperidol	N05AD01	52	883	76,890	33,902
Droperidol	N05AD08	2	35	207	47
Flupentixol	N05AF01	3	166	18,619	24,178
Clopenthixol	N05AF02	3	39	1,275	5,975
Chlorprothixene	N05AF03	1	7	403	668
Tiotixene	N05AF04	1	5	566	201
Zuclopenthixol	N05AF05	1	38	327	649
Pimozide	N05AG02	2	4	92	53
Loxapine	N05AH01	2	22	2,479	2,115
Clozapine*	N05AH02	7	72	13,017	55,881
Olanzapine*	N05AH03	2	69	9,864	58,255
Quetiapine*	N05AH04	2	46	1,716	13,068
Sulpiride	N05AL01	59	3,344	70,924	82,075
Lithium	N05AN01	5	142	13,002	7,892
Risperidone*	N05AX08	8	236	18,552	84,886
Clotiapine*	N05AX09	1	92	5,375	3,961
Zotepin*	N05AX11	2	53	7,170	3,981
Total		227	11,446	290,977	392,337
Conventional antipsychotics		205	11,291	235,284	172,305
Atypical antipsychotics		22	464	55,692	220,032

*Atypical antipsychotics.

ATC = Anatomical Therapeutic Chemical classification system; DDD = defined daily dose.

Table 2. Patterns of atypical antipsychotic drug use among the 200,000-person cohort from 1997 to 2001

	1997	1998	1999	2000	2001	Total
No. of DDDs	11,396	21,807	32,848	41,036	55,692	
No. of recipients	111	183	250	337	464	713
New users						
No.	111	119	121	153	209	
Female	47	50	59	75	93	324
Male	64	69	62	78	116	389
Mean age in y (SD in parentheses)	37.8 (12.6)	38.5 (16.7)	43.2 (20.6)	49.5 (22.4)	50.8 (22.9)	
Diagnostic distribution in %						
Schizophrenia	67	71	61	52	44	57
Affective disorder	24	18	18	14	20	19
Other psychiatric disorder	8	9	15	24	25	18
Nonpsychiatric disorder	1	3	6	10	11	7

DDD = defined daily dose; SD = standard deviation.

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Comment

- Unverified billing diagnoses

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Implications

- Identification of unmet needs
- Diffusion of new technology
(pharmaceuticals)
- Projection of cost growth

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敬請指教

