



3rd International Pharmacy Conference

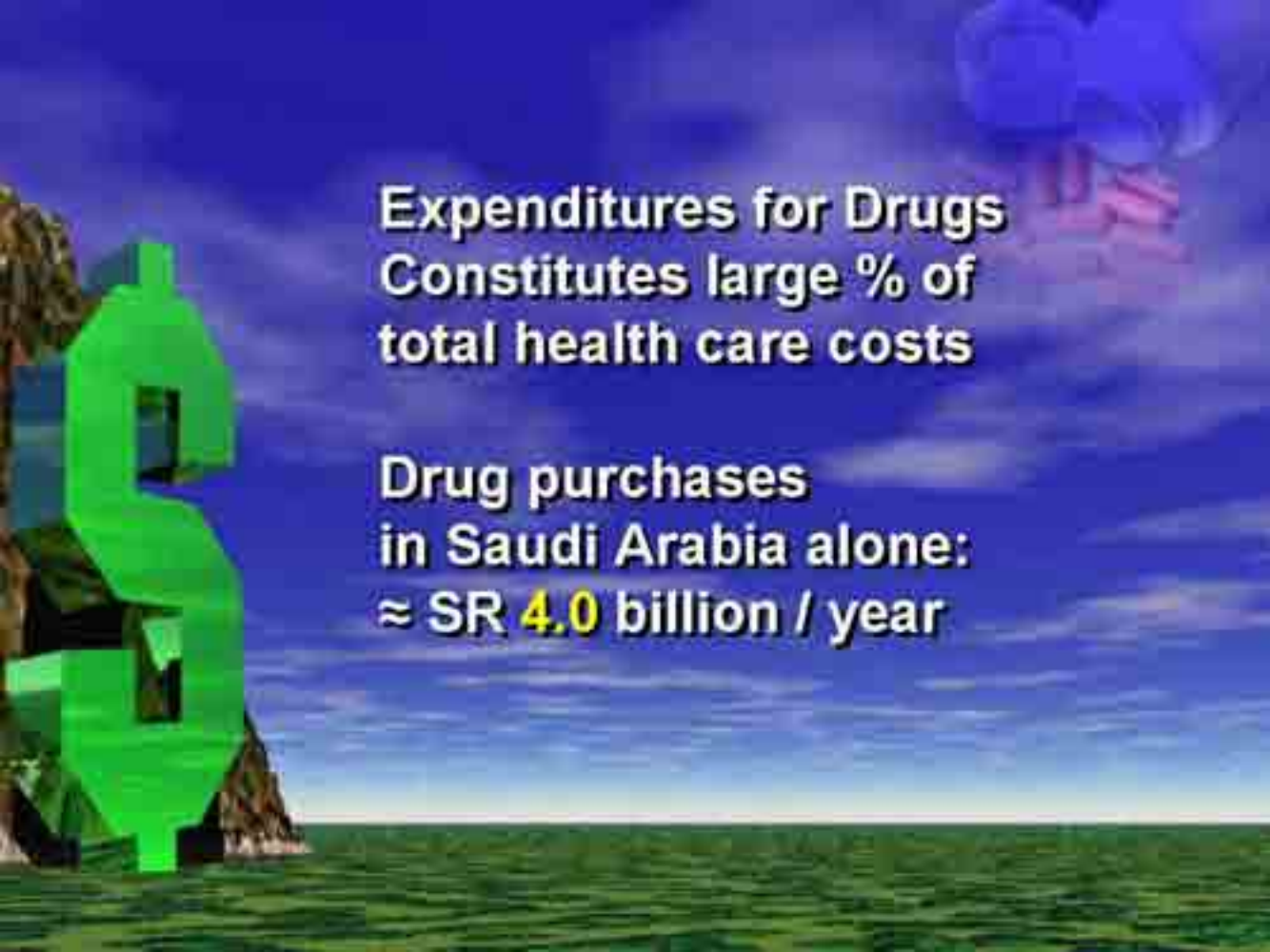


THE EXTENT OF MEDICATION USE & WASTE AMONG FAMILIES IN SAUDI ARABIA AND GULF COUNTRIES

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**Expenditures for Drugs
Constitutes large % of
total health care costs**

**Drug purchases
in Saudi Arabia alone:
≈ SR 4.0 billion / year**

2001

17%

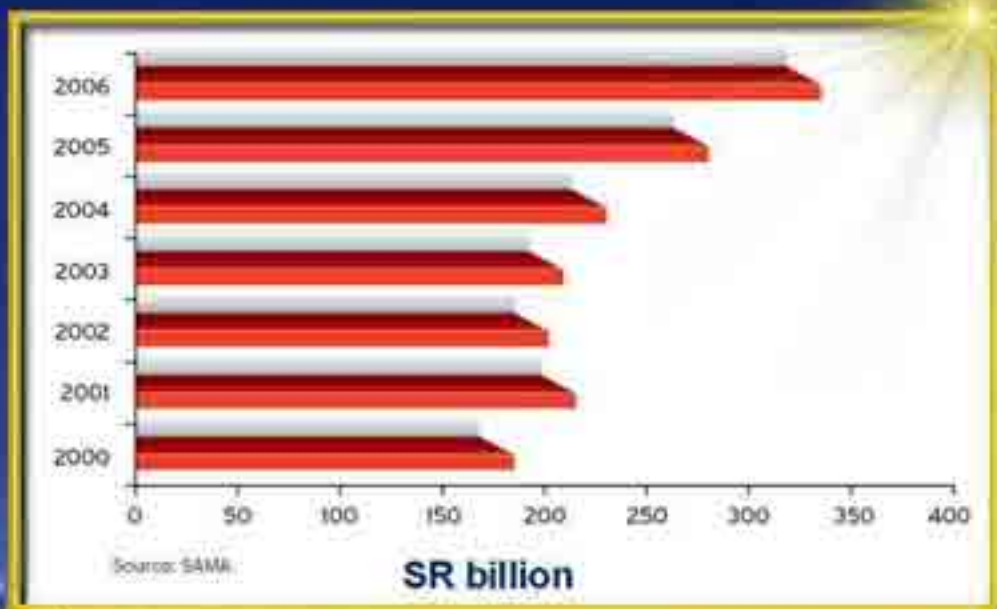
Health Care Budget US\$ 5.84 BN

Drug Expenditure US\$ 1.0 BN

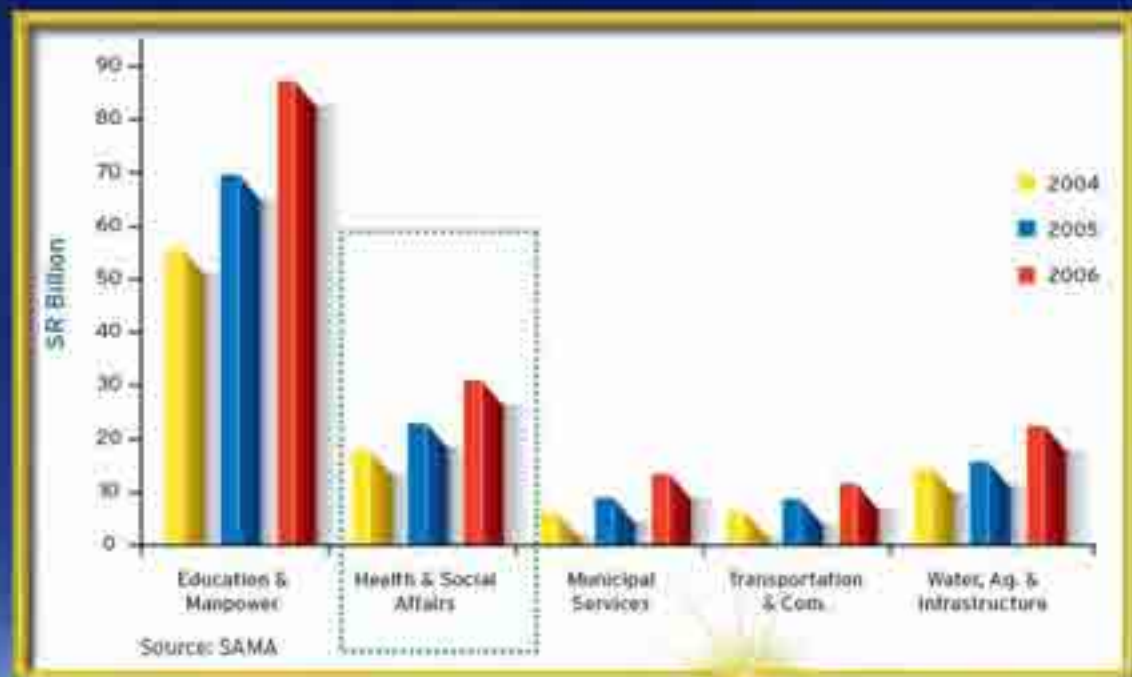
3% annual increase
in expenditure



Budgeted Spending 2000-2006



Sectorial Allocations (2004-2006)



2006

Health Care Budget	US\$ 8.3 BN
Drug Expenditure	US\$ 1.5 BN



Some Reasons:

- Increased marketing costs
- Expenses of New drug development
- **Medication Wastage**
 - Poor compliance
 - Multiple hospital visits
 - Lack of control on drug sales
 - Excessive & Irrational Prescribing



OTHER COUNTRIES

Britain

- 50% of patients are noncompliant (RPSGB, 2002)

- Survey 111 households: (Skinner et al., 1998)
51% of medicines not in current use

- Survey by TV station: (PJ, 2000)
33% do not complete full course
25% admitted having unused drugs



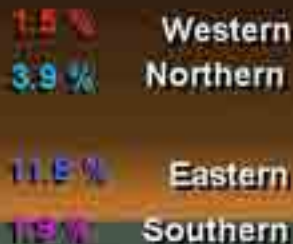
OBJECTIVES

**Study families in Saudi Arabia
and GCC Countries in terms of:**

- Drug consumption**
- Drug Wastage**



GCC 87 Families



SAUDI ARABIA

1554 Families
(185 Expatriates)

88.1% Saudi
11.9% Expat



22 Saudi Cities



Dammam

Abha

Jeddah

Safwah

Al-Madinah

Al-Qateef

Tabuk

Al-Jouf

Hail

Al-Majma'ah

Al-Qassim

Al-Hofouf

Al-Jubail

Ar Ar

Al-Kharj

Tarout

Hafr Al-Batin

Tmair

Al-Muzahmiyah

Jazan

Ras Tannourah

HOUSEHOLDS SURVEYED

20 Millions

2.7 million Families

0.055 % of population



1641 Families
10872 Individuals

Collected:

Demographic data

- Family size
- Socioeconomic status
- Number & ages of dependents
- Education & Profession

Health Status

- Number of Hospital visits / year
- Number of Community Pharmacy visits / year
- Health-related Expenses / year
- Self Medication
- Others



Attitude

- **Storage of Medication**
- **Preferred Drug Information Source**
- **Use of Herbal & Alternative Medicine**
- **Others**



Household Medicines Inventory

Recorded:

- Name
- Manufacturer
- Dosage form
- Strength
- Dates
- Cost
- Original No. of Units
- Remaining No. of Units



Statistical Analysis

- Wilcoxon rank sum test
 - (Mann-Whitney U test)
 - Chi-square test
 - Fisher Exact test
 - t-test
 - Kendall tau-b
 - Spearman rho correlation
 - ANOVA
 - Kruskal-Wallis test
 - Others
-



Family Size

Saudi Arabia	6.60 ± 3.2
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Oman	7.78 ± 3.1
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Gulf	7.74 ± 3.2
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	KSA	Oman	Gulf
Family Size	6.60	7.78	7.74
Children < 5 yr	0.97	0.75	0.68
Children 5-12 yr	1.3	1.35	1.22
Children > 12 yr	2.0	3.3	3.41

SOCIOECONOMIC Status



HERIDITARY DISEASES

KSA



Gulf = 32.2 %

Expatriates in KSA = 15.7 %

Gulf = 49.4 %

Expatriates = 31.9 %

- Heart Conditions
- Diabetes Mellitus
- Hypertension
- Cancer
- Asthma
- Pain



CHRONIC DISEASES

How to use medication ?

Father knows ?



Check Date ?

64.9%

23.8%

11.3%

Rarely

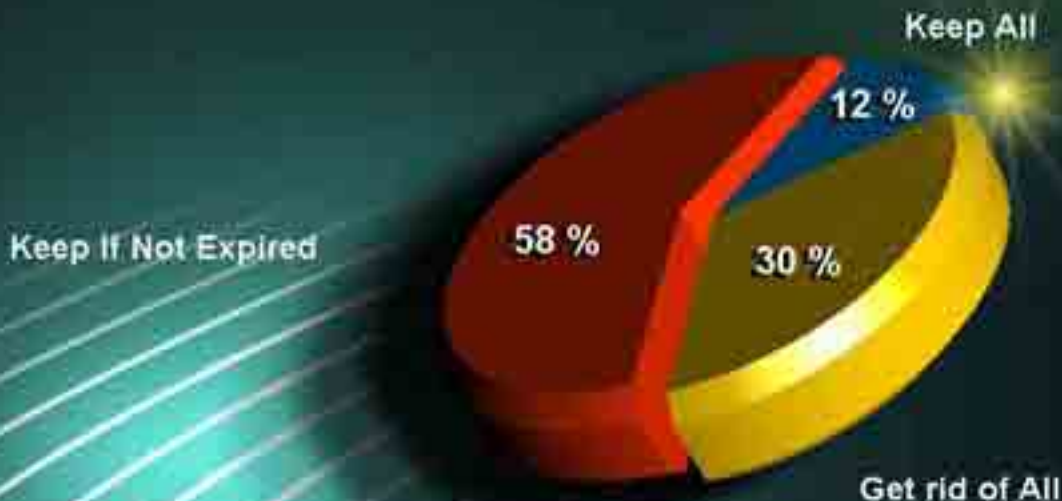
Sometimes

Always



Drugs Expired ?

What do you do ?



Preferred

Information Source



Drug-related Poisoning Cases in Households of 1641 Families

6.4 %



8.1 % for Non-Saudis

Overdosage

Expired Medications

Multiple Drugs

Wrong Self Medication

Significant in Families with more Children ($p < 0.05$)


SELF MEDICATION

Take medicines from relatives or friends ?

KSA	Oman	Gulf
20.6 %	40.0 %	29.9 %

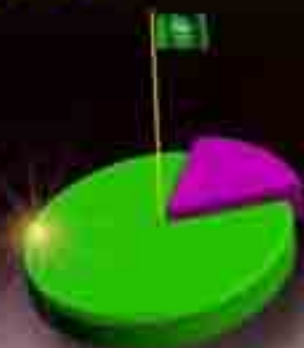
Buy medicines on advice of relatives or friends ?

KSA	Oman	Gulf
43.9 %	55.0 %	49.4 %



Do you ask Pharmacist to prescribe OTC for you?

KSA
80.6 %



Oman
92.5 %



Gulf
83.9 %



PHARMACOECONOMIC ASSESSMENT

- Health Expenses
- Household Inventory
- Family Youth Index
- Wastage Estimates



Source of Medication

	KSA	Oman	Gulf
Government Sources	51	64.8	87.4
Private Sources	35	35.2	11.5
Both	14		1.1

%



% Out-of-Pocket Expenditure on Drugs Relative to Annual Income

KSA

0.72 %

Oman

0.66 %

Gulf

0.48 %

USA = 0.78 % – 1.0 %



Health Expenses

	KSA	Oman	Gulf
Hospital visits / yr	7.75	6.70	6.70
Annual Income (US \$ 1000)	32.77	28.9	34.8
Health Expenses / yr (US\$)	587.5	230.0	342.5
% Health Expenses to Income*	2.62	0.96	1.05

* Based on median income of \$ 22,500

SOCIOECONOMIC Status

Medications Found

in Households

SNF Classification



	n	%	n	%
Respiratory	2095	(16.8)	94	(15.3)
CNS	2050	(16.4)	84	(13.6)
Anti-infective	1779	(14.3)	111	(18.0)
Gastrointestinal	1382	(11.1)	60	(9.7)
Miscellaneous	847	(6.80)	57	(9.3)
Nutrition / Blood	823	(6.60)	24	(3.9)
Musculoskeletal	790	(6.30)	52	(8.4)

Medications Found

SNF Classification

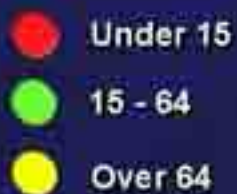


	n	%	n	%
Skin Products	735	(5.9)	33	(5.4)
ENT	553	(4.4)	26	(4.2)
Cardiovascular	465	(3.7)	60	(9.7)
Eye	398	(3.2)	25	(4.1)
Endocrine	375	(3.0)	16	(2.6)
Obj / Gyn / UT	140	(1.1)	12	(1.9)
Cytotoxic	31	(0.2)	-	(-)

Kendall Tau-b = 0.75, p < 0.001

Spearman Rho = 0.86, p < 0.001

Saudi Arabia



Age Distribution

Family Youth Index (FYI)

$$FYI = 1 - \frac{\sum A_i}{n \cdot Q}$$

A_i = Age of i^{th} family member

n = Family Size

Q = Life Expectancy

$$0 \leq FYI \leq 1$$

The higher the Index
The younger the family

- 0.4 - 0.59 Old Family
- 0.6 - 0.79 Middle-aged Family
- 0.8 - 0.99 Young Family



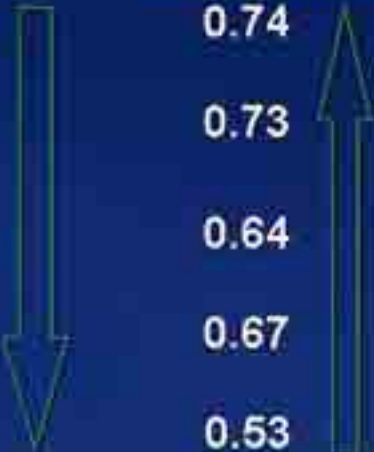
FYI	n	No. Children	No. Hospital Visits	% Health Expenses to Income / year
≤ 0.5	96	1.3	2.6	3.2
0.51 – 0.60	148	2.3	2.0	3.7
0.61 – 0.70	358	4.2	1.3	2.0
0.71 – 0.80	532	5.6	1.1	2.2
≥ 0.81	94	3.6	0.84	1.7

Implications of Family Youth Index (FYI)





FYI	n	%	Out-of-pocket Drug purchase \$	% Out-of-pocket Drug purchase to Annual Income
≤ 0.5	96	7.8	138	0.74
0.51 – 0.60	148	12.0	147	0.73
0.61 – 0.70	358	29.2	150	0.64
0.71 – 0.80	532	43.3	162	0.67
≥ 0.81	94	7.7	157	0.53



Family Youth Index & Out-of-Pocket Expenditure



FYI**n****% Wastage
(based on number)****% Wastage
(based on cost)****≤ 0.5**

96

24.5

24.3

0.51 – 0.60

148

20.2

29.3

0.61 – 0.70

358

19.4

27.4

0.71 – 0.80

532

20.7

31

≥ 0.81


94

21.5

30



Family Youth Index & Wastage






	KSA	Gulf
Total Cost / Family	51.0	34.1
Cost / Individual	10.5	5.2
Cost Expired / Family	9.3	7.7
Cost Expired / Individual	1.9	1.3

Saudi Arabia




Expiration Cost

Per Household

			
Drugs / Household	8.0	7.7	7.1
Expired Drugs / Household	2.2	3.8	2.7
Cost of Drugs / Household (US\$)	51.0	28.0	34.1
Cost of Expired Drugs (US\$)	9.3	6.5	7.74

Expiration Cost

Per Individual Family Member

			
Drugs / Individual	1.53	1.2	1.01
Cost Expired / Individual (US\$)	1.9	1.0	1.32
% WASTAGE (Number)	25.8	53.0	41.3
% WASTAGE (Cost)	19.2	24.8	25.0

Drugs Collected

A photograph of a pill tray with several red pills, a spilled white pill bottle, and a glass of water. The scene is set against a dark background, possibly a sink or countertop. The pill tray is white and contains several red, round pills. A white pill bottle is tipped over, with its cap off. A clear glass of water is partially filled. The overall lighting is dramatic, with strong highlights and deep shadows.

12,463

KSA

616

Gulf

25.8 %

Waste

Based on
Number of Drugs





19.2 %

**Waste
Based on
Total Cost of Medicines**

SR 759.2 millions

per year

% of Drugs of Total Family
Consumption bought per Year

45.26 %

Average Annual Purchase

SR 609.05

Total Annual Consumption

SR 1345.7

Average Family Size

6.64

Number of Families

2.7 million

DRUG EXPENDITURE

SR 3.65 Billion



ANNUAL DRUG EXPENDITURE

Semi-Official Estimates

SR 4.0 Billions

Our Estimates

SR 3.65 Billions



Other Hidden Costs

- Hospitalization
- Drug-Drug Interactions
- Poisoning Episodes
- Additional Treatments
- Work Absenteeism



Other Hidden Costs

Work Absenteeism in UK

177 million working days were lost
as a result of sickness absence



ECU 13.2 billion
in lost productivity

Unused Medicines Collection Campaign

Collected Medications can be used in:

- Relief Programs
(Saudi Red Crescent)
- Charity Donations
- Resold at Reduced Prices



- **Drug Education Campaign**

- **Households**
- **Schools**
- **Media**

- **Pharmacovigilance Programs**



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