

A Primer on Pharmacoeconomics

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Introduction

- Outcomes research calculates clinical effectiveness
- Pharmacoeconomics provides information for purchase / formulary decisions

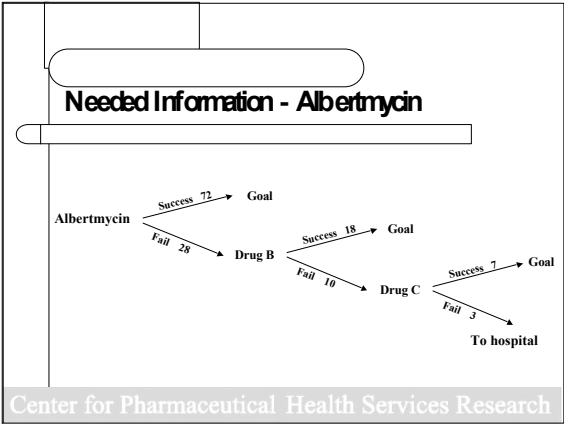
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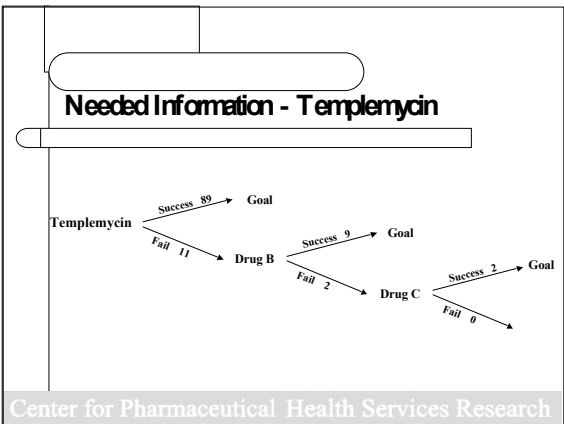
2 Macroid Antibiotics

- Albertmycin \$ 200 / 100 capsules
- Templemycin \$ 242 / 100 tablets

Which should we buy ?

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Costs

• MD visit	\$ 50
• Additional Rx	\$ 50
• Lab Work	\$ 75
• Albertmycin / mth.	\$ 240
• Templemycin / mth.	\$ 290
• Hospital Admission	\$ 2000

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Albertmycin – costs for tx 100 pts	
100 * 240 (drug)	= \$24,000
28 * 50 (visit)	= \$ 1,400
28 * 50 (drug B)	= \$ 1,400
10 * 75 (lab)	= \$ 750
10 * 50 (visit)	= \$ 500
10 * 50 (drug C)	= \$ 500
3 * 2000 (hosp)	= \$ 6,000
Total	\$ 34,550

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Templemycin – costs for tx 100 pts	
100 * 290 (drug)	= \$29,000
11 * 50 (visit)	= \$ 550
11 * 50 (drug B)	= \$ 550
2 * 75 (lab)	= \$ 150
2 * 50 (visit)	= \$ 100
2 * 50 (drug C)	= \$ 100
Total	\$ 30,450

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- Pharmacoeconomics Methodologies**
- Cost Minimization Analysis
 - Cost Effectiveness Analysis
 - Cost Benefit Analysis
 - Cost Utility Analysis

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Cost Utility Analysis

- QALYs
- Common Denominator for Diverse Alternatives

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C.U.A Examples

Water Treatment Upgrade	\$25,000 /QALY
Additional Food Inspectors	\$40,000 /QALY
Highway Guard Rails	\$30,000 /QALY
Bone Marrow Transplant	\$50,000 /QALY
Immunization Program	\$1,000 /QALY

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Outcomes Research Pharmacoeconomics Research Methods

Primary Data vs. Secondary

- **Primary**
 - cost, time compromises
- **Secondary**
 - how old
 - who did
 - purpose
 - generalizable
 - size
 - random

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Conducting Research
– Ideal

Randomization
Control Group
Confidence Intervals (p value) 0.05 = 5% random
Event responsible
Hypothesis driven, (null o+ +)

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Descriptive vs.
Experimental Design

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**Quasi-Experimental
Campbell/Stanley**

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Designs

- a) **Clinical Trial, Randomized, Double-blind, Crossover, Placebo control**
- b) **Parallel tx & control**
- c) **Pre – post, own control**
- d) **Post only**

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Data Collection

- 1. **In person interview**
- 2. **Diary / Log**
- 3. **Phone**
- 4. **Mail**
- 5. **Internet**
- 6. **Observation**

Clinical Questions

a) **Administrative records**

b) **Medical records**

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Statistical Issues

Validity
answer is accurate/honest

Reliability
asking the right questions

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Type 1 & Type 2 Errors

1. **Missing artifact**

2. **Recording false positive**

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Variables impacting

- A. Stigma
- B. Length of Memory
- c. Socially acceptable answers
- D. How private/personal

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Power & Sample Size Formulas

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**Randomization -
Table of #'s, computer generated**

Special Questions – Compliance

- Ask Patient
- Pill Count
- Refill Records
- Apria Chip in Cap

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Questionnaire

Directed list to choose from
Undirected
Disguised
Scaling (Likert – equal interval)

- 1-7
- Smiling faces
- Pain

Open Ended/Closed
Length – completion rate
Reading Level = # syllables, # clauses in sentences

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What's Wrong With

“Have you taken ibuprofen or ASA in last 6 months?”

“Have you taken meds after meals?”

“Measure Loratadine this winter vs. last spring”

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**Asymptomatic Conditions
Special Challenge**

- Pretest – understanding , ambiguity
- Asymptomatic Conditions Special Challenge

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End Points

- blood pressure
- HbA₁C
- viral load
- acne
- GERD
- Alzheimer's Disease

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An Additional Option

Meta Analysis

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An Additional Option

NNT, denominator effect
BMD testing at 40 vs – age 50

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Definitions

- Longitudinal**
- Cross Sectional**
- Prevalence**
- Incidence**

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Data Sources

NCS	UN
Health US	CIA
WHO	World Council Churches
Unicef	OECD
Quality of Life (7 scales)	Benchmarking

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Questionnaire Design

- a) **Sensitive Q's at end after time investment**
- b) **Cover letter estimate & rationale**
- c) **Coding – on form, under stamp, color paper, sequence of several questions**
- d) **Survey Design, Babbe**

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Generalizability

- Size
- # sites
- Geographic Dispersion
- Target population

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Response Rates

- 1) **Non-responder bias**
- 2) **Acceptable differs for diff. groups**
- 3) **Boosting**
 - post card in advance
 - follow-up postcard offer another Q in 2 weeks
 - follow up instrument
- 4) **Literature**
 - pretty stamped
 - look individualize
 - different color signature
 - celebrity writer of letter or institution
 - sent back to another party

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Other Issues Influencing OR Study

- 1) **Length of data collection period**
- 2) **Consider seasonal adjustments**
- 3) **Controlling for events – i.e.: new product intros, new knowledge/publication**

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Human Subjects Protection

- A. Institutional Review Board
different levels of risk
- B. Privacy as well as risk of new tx
- C.
 1. pt. can refuse to participate w/o effect
 2. path to exit study known
 3. privacy methods explained

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Odds & Ends

Present Value

- a) Costs in the future
- b) Benefits in the future

Sensitivity Analysis Bracket

if used 6%, try 4% and 8%

Perspective – mostly done with payer

Willingness to pay concept

- ok if insurer pays
- not ok often if out of your pocket

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Odds & Ends, continued

Insurance Principles

Coverage for unpredictable personal events. It spreads risk, but does not alter susceptibility, severity or risk.

	insure	
susceptible	High/L	High/H
	Low/L	High/L
	severity	

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Status of O.R

Serious international interest
 Major firms conduct for all new products Phase 4
 head:head

FDA

Phase	1.	safety
	2.	dosage
	3.	clinicians
Phase	4.	interactions, side effects, co-morbidities

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Rx Intelligence
Blue Cross Plans

Australia
 Canada
 Sweden
 NICE

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What can a Network Contribute:

- Comorbidity studies
- Registries
- Head:Head cohorts
- Concomitant therapy reports
- DC reports
- ADR reports
- Pt. Contact : Access
- Q of L, Pt. Statistics
- P-ec piggyback studies
- Observational Studies
- Market Share Impact
- Customized Studies

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Literature Critique Checklist

Sample size?
 Randomization?
 Control group
 Clear methodology
 Methods Conventional?
 Perspective Stated?
 Response Rate validity test done?
 Recommendations/Conclusion supported by Data, Results?
 Scaling on tables/figures stats appropriate?

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Keeping Up With the Field

ISPOR – Princeton, NJ
Journals
 Value in Health – ISPOR
 Clin. Therapeutics
 J.ManCare Pharmacy – AMCP
 DM & OR
 JASHP
 Inquiry
 Medical Care
 Health Affairs

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Group Questions

How do you know if Zithromax works?
 Pts B.P. remains 175/125.
 Can we determine cause?
 Impact of a Bayer ASA radio Ad?
 Beta blockers used for off-label
 Preconcert – how can you tell use?

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Conclusions

- It is always necessary to look at all variables prior to decision making
- This can be modified with consideration of quality of life calculations

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