




INTRODUCTION TO DRUG UTILISATION RESEARCH (DUR) WITH EMPHASIS ON METHODOLOGIES

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Overview of presentation



- Introduction
- Rational use of medicines
- Definition of drug utilisation research (DUR)
- DUR process
- Purposes of DUR
- Types of DUR studies
- Study methodologies
- Data sources
- Classification systems
- Practical examples



Outcomes

On completion of this workshop, participants will be:

- Familiar with the various drug utilisation research methodologies (quantitative and qualitative)
- Able to conduct a basic research project and be familiar with the different steps involved
- Analyse and interpret treatment and medicine usage patterns and the factors involved from different perspectives

Rational use of medicines

- Right patient
- Right indication/diagnosis
- Right medicine
- Right dose/administration
- Right information
- Right moment to stop or change



Inappropriate drug use

- Adverse effects
- Sub-optimal outcomes
- Waste of resources
 - Money
 - Health professionals' time
 - Patients' time



Reasons why are drugs not used rationally

- Lack of training and knowledge
- Marketing practices
- Financial incentives for irrational use
- Availability problems (e.g. out of stock)
- Patient expectations
- Prescribing as a means to finish the consultation
- Health systems and services effects
- And many more ...



MOTIVATION ...

Viewpoint

Disease burden in sub-Saharan Africa: what should we conclude in the absence of data?



Richard S Cooper, Babatunde Oostimehin, Jay S Kaufman, Terrence Forrester

Published in: Lancet, 1998; 352: 208-201.



Drug utilisation

Defined as ...

"the prescribing, dispensing, administering, and ingesting of drugs" (Serradell, *et al.*, 1987: 994)

World Health Organisation (WHO) definition (1977):

"The marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences" (Serradell, *et al.*, 1987: 994)



Guideline

<http://apps.who.int/medicinedocs/pdf/s4876e/s4876e.pdf>

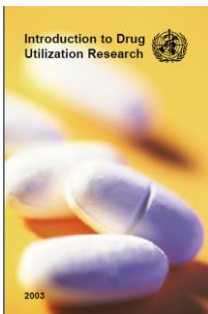


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- Chapter 1: What is drug utilization research and why is it needed?
- Chapter 2: Types of drug use information
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- Chapter 4: Economic aspects of drug use (pharmaco-economy)
- Chapter 5: Drug classification systems
- Chapter 6: Drug utilization metrics and their applications
- Chapter 7: Solutions to the exercises
- Acknowledgements



Drug Utilization Research: Methods and Applications — book launch

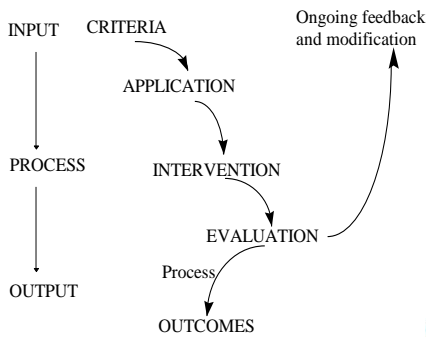


Where do you start?

- Method?
- For what reason?
- How will the outcome be used?



Systems view of drug utilisation



Drug Utilisation Review (DUR) process

- Design the basic structure
- Seek approval
- Construct indicators and criteria
- Apply indicators and criteria to database
- Evaluate and analyse yield (data)
- Establish prescribing patterns
- Establish intervention strategies
- Measure outcomes
- Reapply criteria to database
- Revise indicators and criteria as needed



Purposes of DUR

- Improvement of the quality of care
- Containment of the cost of medical care
- Identification and control of fraud and abuse



Types of Drug Utilisation Review


- Retrospective studies
- Concurrent reviews
- Prospective reviews







From DUR to intervention

- **Drug utilisation studies**
Tend to be descriptive, aggregate data ("What?")
- **Indicator studies**
More focused on rational drug use ("What? → How much?")
- **Qualitative studies** ("Why?")
- **Intervention studies**
How much? Why? → *Intervention* → "How much now?"
Conclusion → Does it work? Is the intervention effective?
- **Management studies**
Is the intervention reproducible? Is it cost-effective?



STUDY METHODOLOGIES



Methods used in drug utilisation studies

- Studies on prescription habits
- Studies on patient compliance
- Studies on drug effects
- Studies on patients' knowledge about drugs
- Ad hoc studies
- Methods used in qualitative studies
- Descriptive studies, determinants of drug utilisation and impact of drug use
- Consumption studies
 - Cost studies
 - Studies based on numbers of units sold
 - Studies on prescription volume
 - Defined Daily Dose (DDD) and Prescribed Daily Dose (PDD)



Quantitative vs Qualitative DUR

Quantitative DUR

- Quantification of data (measurements, counts, summaries ...)
- Hypotheses testing
- Causal relationship between measurable variables
- Results with some degree of confidence

Qualitative DUR

- Looking for the quality of events
- Exploration of social phenomena
- Gaining insight into the context
- Giving emphasis to the meanings, experiences and views of participants



Example: Patient compliance

Quantitative DUR

Quantification, relations, significance

- What is the frequency of non-compliance?
- Relationship between age and non-compliance?
- Relationship between gender and non-compliance?

Qualitative DUR

Exploration, meaning, understanding

- Why are younger patients not compliant?
- What are the thoughts among pharmacists about non-compliance in patients on anti-hypertensives?



Descriptive and analytical methods

- Measurement units:
 - Number of prescriptions
 - Number of products
 - Number of tablets/capsules
 - Cost/expenditure
 - DDDs
 - PDDs
- Analyse individual usage patterns:
 - Persistence, switching ...



Descriptive and analytical methods

- Biostatistical methods:
 - Descriptive statistics
 - Sampling
 - Significance
 - Correlation
 - Regression analyses ...



Descriptive and analytical methods

- Qualitative methods (in-depth interviews, focus group discussions, observations ...)
- Purposive sampling and triangulation
- Approaches to the generation and analysis of qualitative data (phenomenology, grounded theory, qualitative content analysis and narrative analysis ..)
- Consensus methods (Delphi and nominal group techniques, consensus development conferences)
- Implementation research (design and carrying out of interventions)
- Quasi experimental study designs (Cost-benefit analysis (CBA), time series analyses)
- Cluster randomised trials
- Quality indicators



CLASSIFICATION SYSTEMS



To standardise studies, need ...

- A **drug** classification system
 - ATC
 - MIMS
 - BNF
 - Others
- A **disease** classification system
 - ICD-10
 - Others



Drug Classification System

Anatomical Therapeutic Chemical (ATC) classification system

Download from:
http://www.whocc.no/filearchive/publications/2016_guidelines_web.pdf



Questionnaire surveys



Focus groups



In-depth interviews



Need to know ...

- Epidemiological study designs
 - Ecological studies, cohort studies, case-control studies, case-crossover studies...
- Epidemiological terminology
 - Prevalence, incidence, exposure, outcomes, relative risk, odds ratio, bias, confounding ...



PHARMACOECONOMICS

- Evaluation of the medico-economic consequences attributable to the use of a drug
- Study designs:
 - Cost-effectiveness (CE)
 - Cost-benefit analysis (CBA)
 - Cost-minimization (CM)
 - Cost utility (CU)
- Economic modelling



PHARMACOVIGILANCE

- Detection, evaluation, understanding and prevention of Adverse Drug Reactions (ADRs) (previously: post-marketing surveillance)
- Aim: To optimise the risk-benefit ratio of marketed drugs at the individual or population level



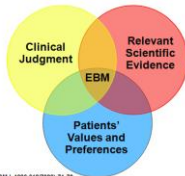
- Side effect = unintended effect of a drug
- ADR = unintended and noxious effect



EVIDENCE-BASED MEDICINE (EBM)

- Conscious, explicit and judicious use of current best evidence in making decisions about individual patients
- Integrates individual clinical expertise with best available external evidence from systematic research

What Is Evidence-Based Medicine?



Beckett CJ, et al. BMJ. 1996;313(7021):71-72

“You cannot *manage*
If you cannot *measure*”



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CONCLUSION AND RECOMMENDATIONS

- Opportunities for research and collaboration
- Cross-national comparisons (CNCs)
- Research:
 - Consumer studies, impact on quality-of-life of patients
 - Diagnoses and sequential care
 - Dosages
 - Concurrent medication, including alternative therapies
 - Ethics: Pharmacotherapy as a “human right” (?), economic determinants, misuse, abuse, dependence and addiction

