

• Pharmacoeconomics refers to the scientific discipline that compares the value of one pharmaceutical drug or drug therapy to another.

• A pharmacoeconomics study evaluates the cost (expressed in monetary terms) and effects (expressed in terms of monetary value, efficacy or enhanced quality of life) of a pharmaceutical product.

• There are several types of pharmacoeconomics

evaluation {
 cost-minimization analysis
 cost-benefit analysis
 cost-effectiveness analysis and
 cost-utility analysis.

• Pharmacoeconomics studies serve to guide optimal healthcare resource allocation in a standardized and scientifically grounded manner.

• Economics is about ^{سبک و سنگین کردن} trade-offs and choices between wants, needs, and the scarcity of resources to fulfil these wants. When considering economics, most people think of the trade-offs b/w goods and services and money; however, the trade-off

might also be expressed in humanistic terms. We are, therefore, careful to include both resource use and humanistic evaluations of drug therapy within pharmacoeconomics assessment.

• Pharmacoeconomics has been defined as "the description and analysis of the costs of drug therapy to health care systems and society."

• Pharmacoeconomics research identifies, measures, and compares the costs (i.e. resources consumed) and consequences (i.e. clinical, economic, humanistic) of pharmaceutical products and services.

Within this framework are included the research methods related to cost-minimization, cost-effectiveness, cost-benefit, cost-of-illness, cost-utility, cost-consequences, and decision analysis, as well as quality-of-life and other humanistic assessments.

• In essence, pharmacoeconomics analysis uses tools for examining the impact (desirable, undesirable) of alternative drug therapies and other medical interventions.

History of Pharmacoeconomics:

Although the economics underpinning of economic evaluation can be traced back to the:

1. Work of Dupuit: 1844

A nineteenth-century engineer Jules Dupuit's pivotal role in the independent French tradition in ^{المكانة الاقتصادية} spatial economic analysis.

Dupuit's invention of market area studies and spatial price ^{فرق الأسعار} discrimination is illustrated with a simple mathematical model. Then his conception of optimal toll structures and their relation to efficient transport systems, regulation and economic welfare is analysed and shown to contain a remarkably modern case for transport deregulation. The paper also assesses Dupuit's role in the development of spatial economics and in the French contribution to the location paradigm in microeconomic analysis.

2. Wilfred Pareto: 1906

In 1906, Italian economist Wilfredo Pareto created a mathematical formula to describe the unequal distribution of wealth in his country, observing that twenty percent of the people owned eighty percent of the wealth.

- In the late 1940s, Dr. Joseph M. Juran inaccurately attributed the 80/20 Rule to Pareto, calling it Pareto's Principle.

While it may be misnamed, Pareto's Principle or Pareto's Law as it is sometimes called, can be a very effective tool to help you manage effectively.

3. Kaldor: 1939, Hicks: 1939, 1941

- Kaldor-Hicks efficiency, named for Nicholas Kaldor and John Hicks, also known as Kaldor Hicks criterion, is a measure of economic efficiency that captures some of the intuitive appeal of Pareto efficiency, but has less stringent criteria and is hence applicable to

more circumstances. Under Kaldor-Hicks efficiency, an outcome is considered more efficient if a Pareto optimal outcome can be reached by arranging sufficient compensation from those that are made better off to those that are made worse off so that all would end up no worse off than before.

4. Johannesson: 1976, the roots of pharmacoeconomics developed in the 1970 following the evolution of pharmacy as a clinical discipline and incorporation of the pharmaceutical sciences into pharmacy curriculum.

5. The concepts of cost-benefit and cost-effectiveness analysis were first introduced in the pharmacy literature by 1978 by McGhan, Rawland, and Bootman.

• Bootman et al also published an early research article in 1979 in which cost-benefit

analysis was used.

6. In 1983, Pathak offered a graduate level course to provide 'an overview of the application of the cost benefit and cost effectiveness analysis in the healthcare with special emphasis on the application of these techniques to the delivery of pharmaceutical care at the Ohio State University (OSU) college of pharmacy.

7. In 1984, Merrell Dow professorship-major issues are: Cost effectiveness of pharmaceuticals for the healthcare delivery system, cost benefit analysis of provision of high quality of information and counseling by pharmacists for the 'wellness' of the American public.

8. The term pharmaco economics itself first appeared in 1986 in print when a presentation by Townseed was published describing the

need to develop research activities.

9. The popularity of Pharmacoeconomics resulted in a journal of the same name in 1992.

Need For Pharmacoeconomics:

. Pharmacoeconomics are needed for offering assistance under resource constraints, tight budgets and competing programs.

. Pharmacoeconomics can aid in decision making in - evaluating the affordability and access to the right medication to the right patient at the right time, comparing two drugs in the same therapeutics class or drugs with similar mechanism of action and in establishing accountability that the claims by a manufacturer regarding a drug is justified.

It is also needed in deciding:

1. Whether a drug should be included in a hospital formulary
2. Which drug would provide net positive benefit to

a particular group of patients.

3. Which would be the best drug for a pharmaceutical manufacturer to develop and the right price to market it.

4. What is the expected QOL improvement with a certain drug when trading-off its side effects.

Applications of Pharmacoeconomics:

1. Historically, the principles of pharmacoeconomics were applied in the field of hospital pharmacy activities.

2. Pharmacoeconomics mainly deals with the cost and consequences, the value of a pharmaceutical product or sources, it depends heavily on the perspective of the evaluation.

3. Common perspectives include those of the patient, provider, payer and society. A pharmacoeconomic

evaluation can assess the value of a product or service from single or multiple perspective.

4. Healthcare practitioners, regardless of practice setting, can benefit from applying the principles and method of pharmacoeconomics to their practice setting.

5. Various decisions that can be supported using pharmacoeconomics, including effective formulary management, individual patient treatment, medication policy and resource allocation.

6. The formulary systems, right from the national level to the institutional level can be strengthened with the help of pharmacoeconomics studies in the areas.

Today the pharmacoeconomic assessment of formulary actions is becoming a standardized part of many pharmacy and therapeutics committee (PTC).

The cost effectiveness data was used to support

the addition or deletion of a drug to or from hospital formulary. The formulary system assists healthcare providers in the evaluation, appraisal, and selection of drugs."

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7. Pharmacoeconomic data can be a powerful tool to support various clinical decisions ranging from the level of the patient to the level of an entire healthcare system.

8. Quality care must be delivered with the least amount of resources possible. Because of the economic climate, institutions and professionals must now evaluate and develop their services. Applying pharmacoeconomic principles to evaluate and develop services will provide information about the value and outcomes of those services. This information can be used to better target services to customers in need of those services, and to better use those services efficiently.

ly and effectively in an environment of scarce resources.

6. Unfortunately, managed care organizations usually evaluate drugs exclusively on clinical efficacy, safety and daily ^{average (cost) effectiveness} acquisition cost without considering overall cost effectiveness.

To remain competitive, managed care organizations need to incorporate pharmacoeconomic consideration into their formulary decision-making process.

Performing an institution wide economic evaluation, conducting pharmacoeconomic studies earlier, perhaps along with clinical trials, using decision analysis, developing standardized guidelines, and increasing education can help overcome current barriers

• For example, a physician could determine for each individual patient whether the premium product would provide a greater reduction in health

outcomes, such as ^{برگشت به مرکز} relapse or ^{renewed admission} hospital readmission, than the alternative treatment in consideration of the patient's current health status. By prescribing a more expensive drug to those patients that the model identifies as having a greater risk reduction profile after treatment, the hospital can potentially reduce costs and reallocate those resources elsewhere.

10. Applied pharmacoeconomics is defined as putting pharmacoeconomics principles, method and theories into practice to ^{مقدار} quantify the value of pharmacy products and pharmaceutical care services.

It will also help in the rationalization of the drug procurement system and practical implementation of the standard treatment protocol and policies related to medicines.

Development and implementation of protocols and guidelines based on sound pharmacoeconomic data can have a great impact on influencing

prescribing patterns and will help to promote appropriate and cost effectiveness use of medicines throughout the healthcare system in the country.

11. CMA shows a cost saving of one treatment program over another.

12. CBA is useful and helping tool for the judicious allocation of funds or resources for public investments in health care. It consists of identifying all the public or social benefits that will result from the program and convert them into money value in which they occur.

13. CUA is used to compare drugs/programs that are life extending with serious side effects or those producing reductions in morbidity.

14. CEA can compare drugs programs that differ in clinical outcomes and use same unit of benefit.

✓ 15. One of the primary applications of pharmacoeconomics in clinical practice today is clinical and policy decision making.

16. Through the appropriate application of pharmacoeconomics, practitioners and administrators can make better, more informed decision regarding the products and services.

✓ 17. The principles and methods of pharmacoeconomics provide the means to quantify the values of pharmacotherapy and balancing cost and outcomes.

✓ 18. In a country like India which is having limited budget for healthcare, pharmacoeconomics can provide the data required to justify certain specific services like establishment of Drug Information centers, Patient counseling services, TDM, hospital formulary system and other patient oriented clinical pharmacy activities and allocating resources for such programs.