

Introduction to Health Economics

Adverse Selection – a market failure where individuals with higher health risk are more likely to purchase insurance, leading to higher premiums. Related terms: moral hazard, risk pooling, premium pricing. In practice, insurers may use medical underwriting to mitigate adverse selection, but this can limit access for high-risk patients. A key challenge is balancing actuarial fairness with equitable coverage, especially in publicly funded systems where risk-adjusted payments are required to prevent cost shifting.

Allocation Efficiency – the degree to which health resources are distributed to achieve the greatest possible health benefit per unit of cost. Related terms: allocative efficiency, Pareto optimality, cost-effectiveness. For example, allocating intensive care beds to patients with the highest likelihood of survival maximizes health gains. However, ethical considerations and equity concerns often complicate pure efficiency calculations, requiring decision-makers to integrate societal values.

Ambulatory Care – medical services provided on an outpatient basis, including primary care visits, specialist consultations, and diagnostic testing. Related terms: primary care, outpatient services, health service utilization. Ambulatory care reduces hospital admissions and can improve chronic disease management. Challenges include ensuring appropriate reimbursement rates and addressing geographic disparities in provider availability.

Annualized Cost – the total cost of an intervention expressed on a yearly basis, facilitating comparison across programs with different time horizons. Related terms: discounting, present value, cost-annualization. For instance, the capital cost of a new MRI machine is spread over its expected useful life to derive an annualized cost. Accurate estimation requires assumptions about depreciation, maintenance, and utilization rates.

Apportionment – the method of allocating shared costs (e.g., overhead, administrative expenses) to individual services or programs. Related terms: cost allocation, indirect costs, activity-based costing. In hospitals, apportioning utilities and building costs to each department enables more precise budgeting. Misallocation can distort cost-effectiveness analyses, leading to suboptimal resource decisions.

Benefit-Cost Ratio (BCR) – the ratio of the monetary value of benefits to the monetary value of costs; a BCR greater than one indicates that benefits outweigh costs. Related terms: net present value, cost-benefit analysis, economic evaluation. A vaccination program with a BCR of 3.5 suggests that every dollar spent yields \$3.50 in health and productivity gains. Critics argue that monetizing health outcomes may overlook distributional effects and ethical dimensions.

Budget Impact Analysis (BIA) – an assessment of the financial consequences of adopting a new health technology within a specific budget context, usually over a short- to medium-term horizon. Related terms: cost-effectiveness analysis, payer perspective, fiscal sustainability. A BIA might estimate the additional spend required for a novel oncology drug over the next five years, helping payers decide on formulary inclusion.

Challenges include data availability, modeling assumptions, and alignment with policy timelines.

Capitation – a payment arrangement where providers receive a fixed amount per enrolled patient, regardless of the number or type of services delivered. Related terms: fee-for-service, risk-adjusted payment, bundled payments. Capitation incentivizes cost containment and preventive care but may lead to under-provision of services if not properly risk-adjusted. Monitoring quality metrics is essential to mitigate potential negative effects on patient outcomes.

Cost-Effectiveness Threshold (CET) – the maximum amount a health system is willing to pay for one additional unit of health benefit (e.g., per quality-adjusted life year). Related terms: willingness-to-pay, incremental cost-effectiveness ratio, health technology assessment. The United Kingdom's National Institute for Health and Care Excellence (NICE) commonly uses a threshold of £20,000-£30,000 per QALY. Setting an appropriate CET is contentious, as it must reflect budget constraints, societal preferences, and opportunity costs.

Cost-Utility Analysis (CUA) – a form of economic evaluation that measures outcomes in terms of utility-based metrics such as quality-adjusted life years (QALYs) or disability-adjusted life years (DALYs). Related terms: cost-effectiveness analysis, health-related quality of life, incremental cost-utility ratio. CUAs enable comparison across diverse interventions, from surgical procedures to public health campaigns. Limitations include the need for robust utility measurement instruments and the ethical debate over valuing life years.

Cost-Benefit Analysis (CBA) – an evaluation that translates both costs and benefits into monetary terms to assess net economic value. Related terms: willingness-to-pay, benefit-cost ratio, discount rate. A CBA of a smoking cessation program might monetize reduced healthcare expenditures, increased productivity, and avoided premature deaths. Critics argue that assigning a dollar value to health and life may obscure equity considerations.

Cost-Effectiveness Analysis (CEA) – compares the relative costs and health outcomes of two or more interventions, expressed as an incremental cost-effectiveness ratio (ICER). Related terms: incremental cost-effectiveness ratio, quality-adjusted life year, health technology assessment. For a new antihypertensive drug, the ICER may be \$5,000 per additional QALY compared with standard therapy. Decision-makers use CEAs to prioritize interventions within constrained budgets.

Cost-to-Serve – the total expense incurred to deliver a health service, encompassing direct, indirect, and overhead costs. Related terms: total cost of ownership, cost accounting, activity-based costing. Understanding cost-to-serve helps hospitals negotiate service contracts and identify inefficiencies. Accurately capturing all cost components, especially indirect costs, remains a methodological challenge.

Cost-Volume-Profit (CVP) Analysis – a managerial tool that examines how changes in service volume affect total costs and profit margins. Related terms: break-even analysis, contribution margin, economies of scale. In a diagnostic lab, CVP analysis can determine the patient volume needed to cover fixed equipment costs. Limitations include the assumption of linear cost behavior and the difficulty of predicting demand fluctuations.

Discount Rate – the factor used to convert future costs and benefits into present values, reflecting time preference and opportunity cost of capital. Related terms: present value, net present value, intertemporal choice. A 3 % discount rate is commonly applied in health economic evaluations; higher rates reduce the present value of long-term benefits, potentially biasing against preventive interventions. Selecting an appropriate rate involves normative judgments and sensitivity analysis.

Demand Elasticity – the responsiveness of quantity demanded to changes in price or income. Related terms: price elasticity, income elasticity, cross-price elasticity. Health services often exhibit inelastic demand because need overrides price sensitivity, but elective procedures may be more elastic. Understanding elasticity assists policymakers in forecasting utilization under different pricing or subsidy regimes.

Drug Utilization Review (DUR) – a systematic assessment of prescribing patterns, medication use, and outcomes to promote optimal drug therapy. Related terms: formulary management, pharmacovigilance, therapeutic guidelines. DUR can identify overuse of antibiotics, leading to targeted stewardship interventions. Barriers include data integration across prescribing systems and provider resistance to audit feedback.

Economies of Scale – cost advantages that arise when production volume increases, lowering average costs per unit. Related terms: economies of scope, learning curve, marginal cost. Large hospitals may achieve economies of scale in procurement of medical supplies. However, diseconomies of scale can emerge if size leads to coordination problems, reduced flexibility, or diminished quality.

Economies of Scope – cost savings achieved by offering a variety of services jointly rather than separately. Related terms: integrated care, shared resources, multi-service delivery. A health system that provides both primary care and mental health services can share administrative staff and information systems, reducing overall costs. Measuring scope economies requires detailed cost allocation and outcome tracking.

Elasticity of Supply – the degree to which the quantity of health services supplied changes in response to price or policy incentives. Related terms: provider responsiveness, capacity constraints, incentive structures. In regions with physician shortages, supply elasticity is low, limiting the impact of higher reimbursement rates. Strategies to improve elasticity include training incentives, loan repayment programs, and telemedicine expansion.

Externalities – costs or benefits that affect third parties who are not directly involved in a transaction. Related terms: positive externalities, negative externalities, spillover effects. Immunization generates positive externalities by reducing disease transmission, justifying public subsidies. Negative externalities, such as antibiotic resistance, may require regulatory controls. Quantifying externalities is complex, often requiring epidemiological modeling.

Fee-for-Service (FFS) – a payment model where providers are reimbursed for each individual service rendered. Related terms: volume-driven incentives, activity-based billing, payment reform. FFS encourages high utilization, potentially leading to over-treatment. Transitioning to value-based models aims to align incentives with quality and outcomes, but requires robust performance measurement.

Health Impact Assessment (HIA) – a systematic process to evaluate the potential health effects of policies,

programs, or projects across sectors. related terms: cross-sectoral analysis, stakeholder engagement, risk assessment. An HIA of a new urban transport plan may predict changes in air pollution exposure and physical activity levels. Challenges include integrating diverse data sources and translating findings into actionable recommendations.

Health Insurance Portability and Accountability Act (HIPAA) – U.S. legislation that protects patient privacy and secures health information, while facilitating data exchange for care coordination. related terms: data protection, patient confidentiality, health information technology. Compliance costs can be substantial for providers, influencing decisions about electronic health record (EHR) adoption. International learners must recognize analogous regulations (e.g., GDPR) in other jurisdictions.

Health Technology Assessment (HTA) – a multidisciplinary evaluation of medical technologies, encompassing clinical effectiveness, cost-effectiveness, ethical, legal, and social implications. related terms: evidence-based medicine, reimbursement decision, comparative effectiveness research. HTA bodies such as NICE in the UK or CADTH in Canada use systematic reviews and economic models to inform coverage decisions. Limitations include time lags, data gaps, and the need for contextual adaptation.

Human Capital Approach – a method for valuing health gains by estimating the present value of future earnings lost due to illness or death. related terms: productivity loss, wage rate, opportunity cost. This approach is common in cost-benefit analyses of occupational injuries. Critics argue it undervalues non-working populations (e.g., children, retirees) and may reinforce gender wage disparities.

Incremental Cost-Effectiveness Ratio (ICER) – the ratio of the difference in costs to the difference in health outcomes between two interventions. related terms: incremental analysis, cost-utility, threshold analysis. An ICER of \$10,000 per QALY for a new vaccine suggests it is cost-effective if the threshold is \$50,000 per QALY. Interpretation requires consideration of uncertainty, subgroup analyses, and budget impact.

Insurance Premium – the periodic payment made by individuals or employers to obtain health coverage. related terms: risk pooling, underwriting, actuarial value. Premiums reflect expected health expenditures, administrative costs, and profit margins. Rising premiums can cause affordability concerns, prompting policy responses such as subsidies or mandates.

Integrated Care – coordinated delivery of health services across settings and providers to improve patient outcomes and system efficiency. related terms: care pathways, multidisciplinary teams, continuity of care. Integrated care models, such as accountable care organizations, aim to reduce fragmentation. Barriers include data interoperability, divergent incentive structures, and cultural resistance among clinicians.

Inverse Care Law – the observation that those who need health services the most often have the least access, particularly in market-driven systems. related terms: health inequity, geographic disparity, social determinants of health. Rural areas may experience fewer specialists, exacerbating the inverse care law. Policy interventions include telehealth expansion and targeted workforce incentives.

Life-Cycle Costing – accounting for all costs associated with a health intervention from inception to disposal, including acquisition, operation, maintenance, and decommissioning. related terms: total cost of ownership, depreciation, sustainability. For a hospital building project, life-cycle costing captures energy

consumption and eventual demolition costs, informing more sustainable investment decisions.

Marginal Cost – the additional cost incurred by producing one more unit of a health service. related terms: variable cost, incremental cost, cost function. Understanding marginal cost helps set optimal pricing and assess the impact of capacity expansions. In practice, marginal cost estimation can be hampered by fixed cost allocation and data granularity.

Market Access – the process of ensuring that a health product or service reaches the intended patient population, encompassing regulatory approval, reimbursement, and adoption. related terms: pricing strategy, health economics, payer negotiations. Successful market access for a novel oncology therapy requires clinical evidence, cost-effectiveness data, and alignment with payer formularies. Obstacles include stringent HTA criteria and budget caps.

Medicaid – a U.S. joint federal-state program that provides health coverage to low-income individuals and families. related terms: eligibility criteria, state variation, reimbursement rates. Medicaid's fee-for-service and managed-care models affect provider participation and service utilization. Funding constraints often lead to low reimbursement, influencing access to specialty care.

Medication Adherence – the extent to which patients follow prescribed treatment regimens. related terms: persistence, compliance, therapeutic outcomes. Non-adherence can increase hospitalizations and overall costs. Interventions such as reminder apps, pharmacist counseling, and simplified dosing aim to improve adherence, yet measuring true adherence remains difficult.

Micro-Costing – a detailed costing approach that itemizes each resource used in delivering a health service, often at the patient-level. related terms: bottom-up costing, resource utilization, cost-itemization. Micro-costing provides high accuracy for pilot studies but is labor-intensive. Scaling up requires robust data collection systems and standardization of cost categories.

Monte Carlo Simulation – a computational technique that uses random sampling to assess uncertainty in economic models. related terms: probabilistic sensitivity analysis, stochastic modeling, risk assessment. In a cost-effectiveness model, Monte Carlo simulation generates a distribution of ICERs, informing decision-makers about the probability of cost-effectiveness at various thresholds. Proper selection of input distributions is essential to avoid biased results.

Net Present Value (NPV) – the difference between the present value of benefits and the present value of costs; a positive NPV indicates a favorable investment. related terms: discounting, cash flow analysis, profitability index. In evaluating a new health information system, NPV incorporates projected savings from reduced paperwork and improved patient safety. Sensitivity to discount rate assumptions can markedly alter NPV outcomes.

Opportunity Cost – the value of the best alternative foregone when resources are allocated to a particular health intervention. related terms: scarcity, trade-offs, resource allocation. Funding a high-cost drug may mean less investment in preventive programs, representing an opportunity cost that must be weighed against expected health gains.

Out-of-Pocket (OOP) Expenditure – direct payments made by patients for health services, not covered by insurance. related terms: financial protection, catastrophic health spending, copayment. High OOP burdens can lead to delayed care and impoverishment. Monitoring OOP trends informs policies aimed at universal health coverage and risk-pooling mechanisms.

Patient-Reported Outcome Measures (PROMs) – standardized instruments that capture patients' perspectives on health status, quality of life, and functional outcomes. related terms: health-related quality of life, instrument validation, outcome assessment. PROMs are increasingly used in value-based contracting to align reimbursement with patient experience. Challenges include selecting appropriate instruments, ensuring cultural relevance, and integrating data into clinical workflows.

Pharmacoeconomics – the branch of health economics that evaluates the cost and value of pharmaceuticals. related terms: drug pricing, cost-effectiveness analysis, therapeutic index. Pharmacoeconomic studies guide formulary decisions, pricing negotiations, and reimbursement policies. Limitations include limited long-term data for new therapies and the complexity of modeling indirect costs.

Population Health Management (PHM) – strategies that aim to improve health outcomes of defined groups by integrating clinical, preventive, and administrative interventions. related terms: risk stratification, care coordination, health analytics. PHM programs often use predictive analytics to identify high-risk patients for targeted interventions, reducing avoidable hospitalizations. Data privacy, interoperability, and provider engagement are common implementation hurdles.

Prevention Paradox – the phenomenon where a preventive measure that brings substantial benefit to the population offers little apparent advantage to each individual participant. related terms: public health, herd immunity, risk communication. For example, water fluoridation reduces dental caries prevalence, yet individuals may not perceive personal benefit, affecting acceptance. Effective communication strategies are needed to overcome resistance.

Price Elasticity of Demand – the percentage change in quantity demanded resulting from a 1 % change in price. related terms: demand sensitivity, substitution effect, price discrimination. Health services often have low price elasticity because of urgency, but elective procedures may be more responsive to price changes. Policymakers use elasticity estimates to forecast utilization under different co-payment structures.

Primary Care – first-contact, accessible, comprehensive, and continuous health care services. related terms: gatekeeping, family medicine, preventive services. Strong primary care systems are associated with better health outcomes and lower costs. Barriers include workforce shortages, reimbursement models that favor specialty care, and fragmented information systems.

Program Budgeting and Marginal Analysis (PBMA) – a systematic approach to allocate limited resources by comparing marginal benefits and costs of alternative programs. related terms: priority setting, incremental analysis, stakeholder engagement. PBMA has been applied in hospitals to reallocate funds from low-impact services to high-impact initiatives. The method requires transparent criteria and robust data on program performance.

Quality-Adjusted Life Year (QALY) – a measure that combines length of life with health-related quality of life,

assigning a weight between 0 (death) and 1 (perfect health). related terms: utility weighting, cost-utility analysis, health state valuation. QALYs enable comparison across disease areas; for instance, a treatment that adds 0.5 QALYs at \$25,000 per QALY may be deemed cost-effective under many thresholds. Challenges include cultural differences in utility preferences and ethical concerns about valuing life.

Randomized Controlled Trial (RCT) – an experimental study design in which participants are randomly assigned to intervention or control groups, providing high internal validity. related terms: clinical trial, blinding, intention-to-treat analysis. RCTs generate efficacy data for HTA and cost-effectiveness models. However, external validity may be limited due to strict inclusion criteria, and conducting RCTs for rare diseases can be impractical.

Reference Pricing – a reimbursement strategy where payers set a maximum amount they will pay for a class of interchangeable drugs; patients pay the difference if they choose a higher-priced product. related terms: price competition, formulary management, therapeutic equivalence. Reference pricing can stimulate price reductions and promote generic uptake, but may lead to patient dissatisfaction if choice is limited.

Risk Adjustment – a statistical technique that modifies payments to reflect the health status or risk profile of patients, ensuring fair compensation for providers serving sicker populations. related terms: case-mix index, actuarial weighting, morbidity adjustment. In the U.S. Medicare Advantage program, risk adjustment mitigates adverse selection. Accurate coding and data quality are essential; otherwise, incentives for up-coding may arise.

Risk Pooling – the aggregation of health risks across a group of individuals to spread financial exposure and stabilize premiums. related terms: insurance market, solidarity principle, actuarial fairness. Larger, more diverse pools reduce the impact of high-cost cases on any single member. In small or homogenous groups, premiums may be volatile, prompting the need for reinsurance or mandatory pooling mechanisms.

Social Determinants of Health (SDH) – non-clinical factors such as income, education, housing, and environment that influence health outcomes. related terms: health equity, upstream interventions, population health. Incorporating SDH into economic evaluations can improve relevance and guide policies that address root causes of disease. Quantifying SDH effects is methodologically complex and often requires interdisciplinary data sources.

Supply-Side Economics – an approach that emphasizes increasing the efficiency and capacity of health service providers to improve overall system performance. related terms: provider incentives, productivity, capacity expansion. Policies such as deregulation of provider entry or investment in medical technology aim to boost supply. Critics argue that supply-side measures alone may not address demand-driven inefficiencies or equity concerns.

Therapeutic Index – the ratio between the dose that produces a therapeutic effect and the dose that causes toxicity. related terms: safety margin, dose-response curve, adverse events. A high therapeutic index indicates a wide safety margin, influencing pricing and market access decisions. Drugs with narrow therapeutic indices often require monitoring programs, increasing overall treatment costs.

Time-Trade-Off (TTO) – a method for eliciting health state utilities by asking respondents how many years of

life they would trade to avoid a particular health condition. related terms: utility measurement, health state valuation, preference elicitation. TTO data feed into QALY calculations for cost-utility analyses. Limitations include cognitive burden on respondents and cultural variability in time preferences.

Total Cost of Ownership (TCO) – the comprehensive cost of acquiring, operating, maintaining, and disposing of a health technology over its useful life. related terms: lifecycle costing, depreciation, cost-benefit analysis. TCO analysis for electronic health record systems includes software licenses, training, and upgrade expenses. Overlooking hidden costs can lead to underestimation of financial commitments.

Value-Based Pricing (VBP) – a reimbursement approach that links price to the clinical benefit and economic value delivered by a health technology. related terms: outcome-based contracts, performance guarantees, health technology assessment. VBP incentivizes manufacturers to demonstrate real-world effectiveness; payers may negotiate price rebates contingent on achieving predefined outcomes. Data collection infrastructure and agreement on metrics are critical challenges.

Value-Based Insurance Design (VBID) – a strategy that aligns patient cost-sharing with the value of services, reducing barriers to high-value care and increasing them for low-value care. related terms: formulary tiering, patient incentives, clinical guidelines. VBID may eliminate copays for essential hypertension medications while imposing higher copays for non-essential brand-name drugs. Implementation requires robust evidence on value and careful monitoring of utilization patterns.

Willingness-to-Pay (WTP) – the maximum amount an individual or society is prepared to spend to obtain a health benefit or avoid a health loss. related terms: contingent valuation, cost-benefit analysis, threshold estimation. WTP studies often use surveys to gauge monetary value of a QALY, informing CET selection. Results can be influenced by income, cultural norms, and framing effects, making interpretation nuanced.

Zero-Based Budgeting (ZBB) – a budgeting process where each expense must be justified from scratch for each period, rather than being based on previous spending. related terms: incremental budgeting, cost justification, resource allocation. ZBB promotes fiscal discipline in health organizations by scrutinizing all line items, but it can be time-consuming and may discourage long-term investments due to short-term focus.