Drug Use Indicators

Dr Olayinka Ogunleye
Consultant Physician/Clinical Pharmacologist
Department of Medicine, LASUTH, Ikeja, LAGOS

Background

- WHO (1995)
  - Conference on Rational Use of Drugs in Nairobi
  - Subsequent efforts globally to improve drug use practices
- Essential tool for such efforts is an objective method to measure drug use in health facilities in a reproducible manner
  - Describing drug use patterns
  - Prescribing behavior

Background

- Drug Use Indicators are sets of objective measures that can define the drug use situation in a country, region or individual facility
- Allows health planners, managers and researchers to make comparisons between situations in different arears or at different times
- Measure impacts of interventional activities.
- Serve as simple supervisory tools to detect problems in performance by health providers or facilities

Background

- DUI currently in use do not measure all the dimensions of the appropriateness of pharmaceutical care
  - Process of diagnosis and pharmaceutical treatment is complex
  - DUI are best understood as first line measures intended to stimulate further questioning and guide subsequent actions

Objectives of a Drug Use Study

1. Describing current treatment practices
2. Comparisons of the performance of individual facilities or prescribers
3. Periodic monitoring and supervision of specific drug use behaviors
4. Assessments of impacts of interventions

Scope of Drug Use Indicators

- DUI were developed as a measure of performance in 3 general areas related to rational use of drugs in primary care
  - Pharmaceutical prescribing practices by health providers
  - Key elements of patients care
    - Clinical consultation
    - Pharmaceutical dispensing
  - Availability of facility specific factors supporting rational use of drugs
    - Essential drugs
    - Minimum pharmaceutical information

Core Indicators 1

- Recommended small numbers of basic indicators/tools for quantifying and reliably assessing a few critical aspects of pharmaceutical use in primary care.
  - Highly standardized
  - Requires no national adaptation
  - Recommended for inclusion in any drug use study using indicators

Core Indicators 2

- Drug Use Indicators will typically be measured within a defined geographic or administrative area, either to describe drug use at a given point in time or to monitor changes over time
- Data needed to measure core indicators are collected from medical records or direct observation at individual facilities
- Core drug indicators are the minimum set of measures to be calculated during a single drug use indicators survey.

Core Indicators 3

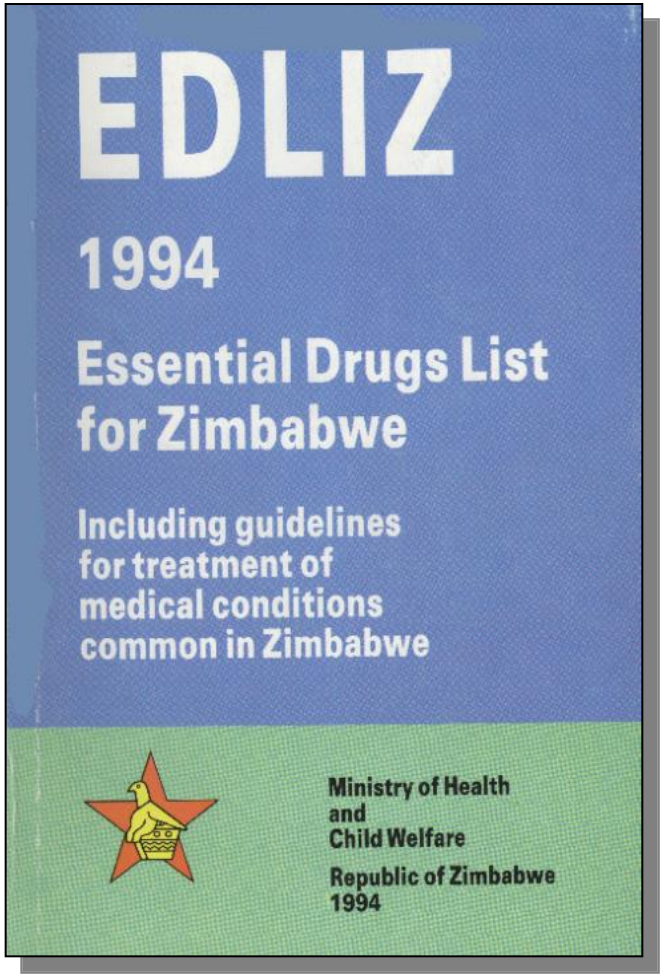
- **Prescribing Indicators**
  - Average number of medicines prescribed per patient encounter
  - % medicines prescribed by generic name
  - % encounters with an antibiotic prescribed
  - % encounters with an injection prescribed
  - % medicines prescribed from essential medicines list or formulary

Core Indicators 4

- **Patient Care Indicators**
  - Average consultation time
  - Average dispensing time
  - % medicines actually dispensed
  - % medicines adequately labelled
  - % patients with knowledge of correct doses

Core Indicators 5

- **Facility Indicators**
  - Availability of essential medicines list or formulary to practitioners
  - Availability of clinical guidelines
  - % key medicines available



Indicators for rational use of drugs

- Average number of drugs per encounter (<2)
- Percentage of drugs prescribed by generic name (close to 100%)
- Percentage of encounters with an antibiotic prescribed (<30%)
- Percentage of encounters with an injection prescribed (<10%)
- Percentage of drugs prescribed from EDL or formulary (close to 100%)

Prescribing Indicators 1

- Measures the performance of health care providers in several key dimensions
- Based on the practices observed in a sample of clinical encounters taking place in outpatient health facilities for treatment of acute or chronic illnesses
- Measures general prescribing tendencies within a given setting, independent of specific diagnosis
- Does not address the adequacy or quality of diagnosis and drug choices.

Prescribing Indicators 2

- **Average number of drugs per encounter**
  - To measure the degree of polypharmacy
  - Combination drugs are counted as one
  - Requires guidelines on how to count certain ambiguous prescribing practices e.g standardized sequential therapies
  - Calculated by dividing the total number of drug products prescribed by the number of encounters surveyed irrespective of whether or not the patient received the drug
  - Example: In health centers in Ibarapa province, patients are prescribed an average of 3.3 drugs per encounter.

Prescribing Indicators 3

- **Percentage of drugs prescribed by generic name**
  - To measure the tendency to prescribe by generic name
  - Investigators must observe the actual names used in prescription rather than names of dispensed products
  - Calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplies by 100
  - E.g. In Nepal health units, an average of 48% of drugs are prescribed by generic name

Prescribing Indicators 4

- **Percentage of encounters with an antibiotic prescribed**
- **Percentage of encounters with an injection prescribed**
  - To measure the overall level of use of two important, but commonly overused and costly forms of drug therapy
  - A list must be made of all the drugs products which are to be classifies as antibiotics

Prescribing Indicators 5

- Investigators must be instructed about immunization not to be counted as injections
- Calculated by dividing the number of patients encounters during which antibiotics or an injection were prescribed by the total number of encounters surveyed, multiplies by 100
- E.g. In dispensaries in Nigeria, 42% of all outpatient encounters were prescribed one or more antibiotics, while injection was prescribed during 34% of all consultations.

Prescribing Indicators 6

- **Percentage of drugs prescribed from essential drugs list or formulary**
  - To measure the degree to which practices conform to a national drug policy
  - Copies of a published national essential drugs list or local institutional formulary to which data on prescribed drugs can be compared must be available
  - Calculated by dividing the number of products prescribed which are listed on the essential drugs list or local formulary by the total number of products prescribed X 100.

Antimicrobial Classification for Prescription Indicators

Antimicrobial classification for prescribing indicators

Count as antibiotic	Code in WHO Model List	Class
	6.1.3	Antifilarials
	6.1.4	Antischistosomals
yes	6.2.1	Penicillins
yes	6.2.2	Other antibacterials
	6.2.3	Antileprosy drugs
	6.2.4	Antituberculosis drugs
	6.3	Antifungal drugs
	6.4.1	Antiamoebic and antigiardiasis drugs
	6.4.2	Antileishmaniasis drugs
	6.4.3	Antimalarial drugs
	6.4.4	Antitrypanosomal drugs
yes	13.2	Anti-infective dermatological drugs
yes	21.1	Anti-infective ophthalmological agents
yes	*	Antidiarrhoeal drugs with streptomycin, neomycin, nifuroxazide or combinations

* Not on WHO Model List of Essential Drugs

Patient Care Indicators 1

- Addresses keys aspects of what patients experience at health care facilities
- How well they are prepared to handle the pharmaceutical products that has been prescribed and dispensed
- Time that the prescribers and dispensers spend with the patient sets an important limit on the potential quality od diagnosis and treatment given

Patient Care Indicators 2

- It is expected that the patient will will at least receive well labelled medications and should understand how to take the drugs
- Does not capture many fundamental issues related to the quality of examination and treatment given

Patient Care Indicators 3

- **Average Consultation Time**
  - To measure the time that medical personnel spend with the patient in the process of consultation and prescribing
  - Procedure for accurately recording the time spent during the consultation: time between entering and leaving the consultation room must be put in place
  - Waiting time not included
  - Calculated by dividing the total time for series of consultation by the number of consultations.

Patient Care Indicators 4

- **Average Dispensing Time**
  - To measure the average time that personnel dispensing drugs spend with patients
  - Procedures for accurately recording the average time patients spent with pharmacists or drug dispensers : time between arriving and leaving the dispensary counter must be put in place
  - Waiting time not included
  - Calculated by dividing the total time for dispensing drugs to a series of patients, by the number of encounters

Patient Care Indicators 5

- **Percentage of drugs actually dispensed**
  - To measure the degrees to which health facilities are able to provide the drugs prescribed
  - Require to have information on drugs prescribed and those actually dispensed at the health facility
  - Calculated by dividing the number of drugs actually dispensed at the health facility by the total number of drugs prescribed multiplied by 100

Patient Care Indicators 6

- **Percentage of Drug adequately labelled**
  - To measure the degree to which dispensers record essential information on drug packages thay dispense
  - Investigators must be able to examine the drug packages as they were actually dispensed at the health facility
  - Calculated by dividing the number of drug packages containing at least patients name, drug name and when the drug should be taken, by the total number of drug packages dispensed, multiplied by 100

Patient Care Indicators 7

- **Patients Knowledge of Correct Doses**
  - To measure the effectiveness of the information given to patients on dosage schedule of drugs they receive
  - Access to a written prescription or to a patient record against which patients' knowledge on the dosage schedule can be checked is required
  - Investigators must be trained to evaluate patient knowledge during the interview or record patients response for later evaluation by a competent person
  - Calculated by dividing the number of patients adequately reporting the dosage schedule for all drugs, by the total number of patients, multiplied by 100.

Required Tasks for Measuring Patients Care Indicators

- Design a procedure for collecting prospective data
- Specify how consultation and dispensing times will be measured
- Identify the sources of data to compare prescribed and dispensed drugs
- Define criteria for adequate patients' knowledge about medications
- Describe procedure for evaluating patients' knowledge

Health Facility Indicators 1

- Many features of the working environment influences ability to prescribe drugs rationally, these include:
  - Adequate supply of essential drugs
  - Access to unbiased information about these drugs

Health Facility Indicators 2

- **Availability of copy of essential drugs list or formulary**
  - To indicate the extent to which copies of the national essential drugs list or local formulary are available at health facilities
  - It is required that a national essential drug list or a local formulary must exist for that level of care
  - It is scored Yes or No for the facility

Health Facility Indicators 3

- **Availability of Key drugs**
  - To measure the availability at health facilities of key drugs recommended for the treatment of some common health problems
  - A short list of 10-15 essential drugs must be compiled that should always be available
  - Calculated by the number of specified products actually in stock divided by the total number of drugs on the check list, multiplied by 100.

Complementary Indicators

- Measures of performance that can be used in addition to the core indicators depending on local circumstances.
- Less standardized because they depend on local variables that should be defined before using the indicators, and methods validated.
- Often more difficult to measure
- Interpretations highly sensitive to local context
- Can not be reliably collected in some settings
- No less important

Examples of Complementary Indicators 1

- **Percentage of patients treated without drugs**
  - To measure the degree to which primary care providers treat patients seeking curative care with non-pharmaceutical therapies
  - Requires full data on drugs prescribed, not just on drug dispensed
  - Calculated by dividing the number of consultations in which no drug is prescribed by the number of consultation surveyed

Examples of Complementary Indicators 2

- E.g. In health centers in Bambisa Region, no drug is prescribed during 2.5% of curative visits
- Measures the proportion of patients who are counselled or referred without being treated.
- No treatment may indicate non availability of drugs in some settings, hence the need for local interpretation.

Examples of Complementary Indicators 3

- **Average drug cost per encounter**
  - To measure the cost of drug treatment
  - A method must be developed for assigning unit costs to each drug prescribed, or to prescription as a whole.
  - Portion reimbursed by the patient must be subtracted if actual costs to the health system are to be measured

Examples of Complementary Indicators 4

- Calculated by dividing the total cost of all drugs prescribed by the number of encounters surveyed
- E.g. A survey of health centers in Zamfara local government found that the average cost per treatment was $1.04
- Though laborious to collect, it is a useful tool when planning changes in drug supply, cost recovery systems, or fees.

Examples of Complementary Indicators 5

- **Percentage of drug costs spent on antibiotics**
- **Percentage of drug costs spent on injections**
  - To measure the overall cost impact of two important, but commonly overused, forms of drug therapy
  - Must identify lists of drugs to be counted as antibiotics and injection
  - Calculated as the costs for all antibiotics or for all injections, divided by the total costs expressed in percentage.

Examples of Complementary Indicators 6

- **Prescriptions in accordance with Treatment Guidelines**
  - To measure the quality of care for some important health conditions where clear standards of pharmaceutical treatment exists locally
  - A list of specific diagnostic categories or symptoms to be included, such as acute respiratory illnesses, lists of products or therapeutic classes to be accepted as rational treatment for these conditions are required.

Examples of Complementary Indicators 7

- Calculated by dividing the number of cases receiving the chosen standard treatment with the total number reviewed expressed in percentage
- E.g. In health centers in Bulu province, 45% of children with diarrhea receive an antidiarrhea drug while 34% receive ORS

Examples of Complementary Indicators 8

- This is potentially the most interesting measure of quality of care
  - Problems exits with defining health problems
  - Problems with defining acceptable treatment
  - Obtaining enough encounters with specific problems during the course of a drug survey
- To make the evaluation of quality of prescribing manageable, it is recommended that attention is restricted to at most five important tracer health problems
  - Selection based on the features of the health system and the goals of the indicator study
  - Makes sense to select problems presenting most frequently at the center
  - Problems that are of particular economic or clinical importance in some environments are also favored.

Examples of Complementary Indicators 9

- **Percentage of Patients Satisfied with the Care they Received**
  - To measure the extent to which patients leave health facilities generally satisfied with overall care received
  - Questions asked patients to score this indicator must be translated in a way that captures two key concepts
    - Being 'generally satisfied': the visit met the patient's basic expectation and needs, rather than absence of any complaint or criticism

Examples of Complementary Indicators 10

- The phrasing for ‘overall care’ should incorporate the entire service at the health facility, including diagnosis, treatment, interpersonal relations e.t.c

– Calculated as the number of patients leaving the facilities report that they were satisfied with the care received expressed as a percentage of total number of patients seen within a defined time frame.

Examples of Complementary Indicators 11

- A very important component of quality of care, but difficult to measure
  - Response often depends on how the question is put
  - Cultural differences in expressing satisfaction
  - Expression of dissatisfaction considered as being rude and unacceptable in some culture
  - Pretest method for cultural acceptability and suitability.

Examples of Complementary Indicators 12

- **Percentage of health facilities with access to impartial drug information**
  - To determine whether accurate and unbiased information about drugs is locally available to prescribers
  - A list is needed of printed materials to be considered a source of impartial information about drugs e.g. commercial drug compedia, information bulletins, therapeutic and formulary guidelines
  - Score the different key publications separately rather than ‘Yes’ or ‘No’ for the facilities.

Examples of Complementary Indicators 13

- Calculated as the number of facilities where a listed source of impartial information is present, divided by the total number of facilities surveyed expressed in percentage.
- Must define what an impartial source of drug information is
  - Industry produced booklet like MIM would not be acceptable
  - Data collector must be provided with lists of acceptable materials and trained to comply strictly with the list in scoring

Steps in an Indicators Study

- Select geographic area
- Select sample of facilities
- Retrospective prescribing data available?
- Simple vs. detailed data form?
- Define criteria for core indicators
- Define complementary indicators
- Describe study procedures
- Select and train personnel
- Pilot test and revise procedures
- Collect data
- Feedback to facilities and managers
- Decide on follow-up studies

Scope of the Indicators Study

- Depends on—
  - **Information needs of managers**
  - **Capabilities of record system**
  - **Types of providers**
  - **Resources available**
- Minimum sample
  - **20 facilities and 30 prescriptions / 30 patients per facility for cross-sectional study**
  - **100 prescriptions per facility if facilities will be compared**

Indicator Sampling Methods

- **Selection of Facilities**
  - Simple Random / Systematic
  - Useful to Stratify
    - Urban / Rural Health / Mission
- **Retrospective Prescribing Data**
  - Systematic
  - Stratified by prescriber?
- **Prospective Patient Encounters**
  - Convenience
  - Quota by Health Problem?

Basic Parameters of different types of Drug Use Studies

	Cross-sectional (basic)	Cross-sectional (comparative)	Supervision	Assess impact of intervention
Objective of the indicators study	To measure drug use indicators in a representative group of facilities	To compare between individual facilities or prescribers, or between groups	To identify whether a facility is above/below a set norm of practice	To assess the impact of an intervention in an intervention and a control group
# of facilities included	20	At least 10 in each group, 20 for more reliable comparisons; for individual comparisons, each facility is considered separately	Each facility sampled separately	At least 20 per group
# of prescribing encounters per facility	30	30 for comparing groups; 100 for individual facilities or prescribers	About 15 for identifying outliers with poor practices	At least 30, but depends on the need for precision
Type of prescribing data	Retrospective or prospective	Retrospective or prospective	Prospective preferred, but retrospective possible	Retrospective preferred, but depends on objectives and structure of intervention
Time frame of prescribing data	One year, if possible	One year, if possible	One day, or short period if retrospective	At least 4-6 months before and after the intervention
Type of patient care data	Prospective	Prospective	Prospective	Prospective (if necessary)

Data Sources 1

- Large Data bases
- Suppliers data
- Practice setting databases
- Community setting databases

Data Sources 2

- Surveys
  - IMS America
    - National Prescriptions Audit
    - National Disease and Therapeutic Index
    - Mail Order Prescription Audit
  - US Department of Health and Human Services
    - National Health CARE Expenditure Survey
  - National Center for Health Statistics, CDC
    - National Health Ambulatory Care
    - National Ambulatory Medical Care Survey
  - Registries
    - Hepatic Registries e.t.c

Data Sources 3

- Computerized Data Bases
  - Diagnosis Linked
    - Drug and Morbidity Data included
  - Non Diagnosis Linked
    - Drug Sales
    - Drug movement at drug distribution channel level
    - Pharmaceutical or medical billing data
    - Samples of Prescriptions

Data Sources 4

- Non Diagnosis Linked Data Base
  - National Prescription Audit (IMS America) – drug distribution
  - US Pharmaceutical Market (drug store, hospitals, drug distribution)
  - Medicaid Management Information System (billing data)
  - Saskatchewen Health Plan
  - UK Prescription Pricing Authority (billing data)

Data Sources 5

- Spain's Drug Data Bank (NIH) (billing data)
- Denmark's Pharmaceutical Prescription Database of the county of North Jutland

Data Sources 6

- Diagnosis Linked Databases
  - National Disease and Therapeutic Index (NDTI)
  - Kaiser Permanente Medical Plan
  - Group Health Cooperative of Puget Sound
  - COMPASS: Health Information Design Inc
  - University of Uppsala, Sweden
  - Sweden Community of Tierp
  - DURbas: Health Information Design Inc
  - Center for Primary Care Research

Simple Prescribing Indicators Form

PRESCRIBING INDICATOR FORM

Location: _____

Investigator: _____ **Date:** _____

Seq. #	Type (R/P)	Date of Rx	Age (yrs)	# Drugs	# Gen-erics	Antib. (0/1)	Injec. (0/1)	# on EDL	Diagnosis (Optional)
1									
2									
3									
30									
Total									
Average									
Percentage					% *of total drugs*	% *of cases*	% *of total cases*	% *of total drugs*	

*** 0=No 1=Yes**

Detailed Prescribing Indicators Form

Detailed Prescribing Indicators form

Location: _____

Investigator: _____ **Date:** _____

ID#	Date	Name	Age	Sex	Prescriber
Health Problems	Health Problem Description		Code		
	1				
	2				
	3				
Drugs	Name and Strength		Code		Quantity
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8,				
	9				

PATIENT CARE FORM

Location:

Investigator Date:

Seq. #	Patient Identifier (if needed)	Consulting Time (mins)	Dispensing Time (secs)	# Drugs Pre-scribed	# Drugs Dis-pensed	# Ade-quately Labelled	Knows Dosage (0/1)
1							
2							
3							
30							
Count							
Total							
Average							
Percentage					%	%	%

* 0=No 1=Yes

Facility Indicator Reporting Form

Location: _____

Investigator _____ **Date** _____

		This Facility	National Standard
Number of Cases	Prescribing		
	Patient Care		
Average Number of drugs prescribed			
Percentage of drugs prescribed by generic names		%	%
Percentage of encounters with an antibiotic prescribed		%	%
Percentage of encounters with an injection prescribed		%	%
Percentage of drugs prescribed on Essential Drug List		%	%
Average Consulting Time		mins	mins
Average Dispensing Time		secs	secs
Percentage of drugs actually dispensed		%	%
Percentage of drugs adequately labelled		%	%
Percent correct patient knowledge of dosage		%	%
Availability of essential drug List or Formulary		Yes / No	%
Percentage availability of key indicator drugs		%	%

Comments

Signatures

Indicators Consolidation Form

Location: _____ **Date:** _____

Date	Facility	Avg. drugs Prescribed	Percent generics	Percent antibiotics	Percent Injections	Percent on EDL	Consult time	Dispense time	%Drugs dispensed	% Adequate label	%Adequate knowledge	Impartial Information	% Drugs in stock
Mean													
Maximum													
Minimum													

Conclusions

- Drug Use Indicators Studies can be undertaken in practically all environments
- Requires appropriate methodologies and adequate planning and execution of studies
- The more attention to details, the greater the value and accuracy of the study.

Q &A