# Module 7: Monitoring and Evaluation of Antimicrobial Stewardship (AMS) Programs

# Learning Objectives

By the end of this module, you should be able to:

1. Describe monitoring and evaluation (M&E)
2. Explain the importance of monitoring and evaluation in antimicrobial stewardship programs
3. Outline principles of sustainable measurements in M&E
4. Identify the different categories of indicators for assessing antimicrobial stewardship programs
5. Describe the stepwise approach on how to assess antimicrobial stewardship programs

# Introduction

- **Monitoring** is a continuous process of collection and analysis of information to compare how well a project, program or policy is being implemented against expected results

- Consists of tracking inputs, activities, outputs and outcomes and other aspects of a program on a continuous basis during implementation period with the aim of  detecting or correcting change or deviation from desirable levels

- The data acquired through monitoring is used for evaluation

# Introduction…

- **Evaluation** is a periodic systematic assessment that is used to draw conclusion regarding the relevance and effectiveness of a project or program

- Focuses on expected and achieved accomplishments, examining the results chain (inputs, activities, outputs, outcomes and impacts), processes, contextual factors and causality, in order to understand achievements or the lack of achievements

- Can be internal, external or involving many key stakeholders

# Monitoring & Evaluation of AMS Programs

- Tracking and reporting of AMS interventions and outcomes are key components of AMS programs

- Monitoring and evaluation helps to:
  - Identify opportunities for improvement
  - Assess the impact of improvement efforts/AMS interventions

- Should be used to determine whether the changes made to improve practice are effective and to what degree

# Purpose of Monitoring and Evaluation of AMS Programs

- Measurements help in:
  - Collecting data for quality indicators; structure, process, outcome and balancing measures
  - Surveillance of antimicrobial use
  - Auditing the quality of prescribing practices
- This information should be used to:
  - Provide feedback to prescribers to influence (enhance) prescribing behavior
  - Inform of the effect of AMS/MTC initiatives on patient outcomes, antimicrobial use and resistance patterns
  - Guide development of targeted initiatives to improve prescribing

# AMS Indicators

- Antimicrobial stewardship programs (ASPs) can be assessed using different categories of indicators.
- Indicators are qualitative or quantitative measurables used to determine if a program is being implemented as expected and achieving the outcomes
- The AMS indicators include:

    i. Structural measures
    ii. Process measures
    iii. Outcome measures
    iv. Balancing measures
    v. Qualitative Measure

# Structural Indicators

- These measures help to determine whether the appropriate governance, workforce and processes (e.g. guidelines and formularies), are in place.
- They assess the capacity, systems and processes in a facility or an organization
    1. Are the right elements in place?
        i. AMS focal person
        ii. AMS Committee with terms of references(ToRs)
        iii. Governance structure in the committee
        iv. Treatment guidelines and formularies
    2. Are the AMS resources, channels of reporting and policies available?

# Process Indicators

These measures for AMS programs determine whether:

1. The systems are performing as planned
2. They are effective or making a difference

- Should be instituted as regular audits, and feedback given to all stakeholders
- Can help improve appropriate antimicrobial use
- Development of process measures should involve multidisciplinary teams to ensure ownership

# Process Indicators

**Examples:**

- Rates and volume of antimicrobial prescribing over time
- Rates of general practice visits, emergency visits or admissions for specific conditions
- Compliance with prescribing guidelines
- Compliance with antimicrobial restriction conditions
- Assessment of surgical prophylaxis given for >24 hours

# Outcome Indicators

These measures for AMS programs determine:

- What is the result of AMS interventions?

Outcome measures should focus on:

- Improved patient safety and outcomes
- Reduced antimicrobial resistance (AMR)
- Reduced healthcare costs

# Outcome Indicators…

- **Examples:**
  - Infection-related mortality, length of stay, time to respond to treatment
  - Surveillance of antimicrobial resistance (e.g. using a cumulative antibiogram)
  - Changes in cost, length of stay, antimicrobial acquisition costs

# Balancing Indicators

These measures for AMS programs:

- Determine whether changes are causing new problems
- Look at potential unintended consequences of AMS interventions
    - e.g. Reduced antibiotic prescribing may result in under-treatment of infections and poorer clinical outcome
- May also introduce selective antibiotic pressure and (re) emergence of drug resistant strains

# Balancing Indicators…

- **Examples**
  - Infection-related mortality
  - Infection-related readmission within 28 days
  - Rates of surgical site infection

# Qualitative Indicators

- Can be used to inform how well the program is operating and help identify further areas for improvement
- User acceptance can be measured directly through surveys
- Questions might cover awareness, effectiveness and the degree to which the AMS program is considered useful
- Helps assess the perceptions and attitudes of prescribers towards AMR and AMS activities

# Qualitative Indicators …

**Examples:**

- Availability of AMS guidelines
- Availability of hospital formulary
- Focus group discussions on relevance of AMS
- Surveys on knowledge attitude and practices in AMS
- Conducting case studies on AMS
- Availability of facility antibiogram
- Open ended surveys on AMS utility in the facilities

# Eight Principles of Sustainable Measurement

1. Seek usefulness, not perfection, in the measurement
2. Use of balanced set of process, outcome and cost measures
3. Keep measurements simple; think strategic, but in smaller measurable interventions
4. Use both qualitative and quantitative data that are fit for purpose
5. Be clear about operational definitions of the measures
6. Measure small representative samples
7. Build measurement into daily work
8. Set up a measurement team

# Surveillance of Antimicrobial Stewardship

**Surveillance** is the ongoing, systematic collection, analysis and interpretation of health related data essential to the planning, implementation and evaluation of public health practices

- Based on information collected, appropriate action can be taken towards implementing a successful AMS program e.g.
  - Guidance to clinicians on rational prescribing of antimicrobials
  - Rational dispensing and use of antimicrobials

# Surveillance of Antimicrobial Stewardship…

**Key Components:**

1. **Data Collection:** Data can be collected on the following areas;
   - **Prescribing Practices:** Data on what is prescribed, by whom, and for what.
   - **Dispensing Data:** Records of how antimicrobials are distributed.
   - **Consumption Patterns:** Analysis across different settings (e.g., hospitals, community).

2. **Data Analysis:**
   - **Trend Analysis:** Identifying changes in use over time.
   - **Benchmarking:** Comparing usage across regions or institutions.
   - **Correlation with AMR:** Examining the link between antimicrobial use and resistance

# Surveillance of Antimicrobial Use

**3. Interpretation & Reporting:**

- **Identify misuse:** Detecting overuse, underuse, or misuse
- **Policy development:** Informing guidelines and regulations
- **Public health impact:** Understanding effects of resistance burden

**4. Feedback & Action:**

- **Clinician guidance:** Providing actionable insights for better prescribing
- **Public awareness:** Educating on responsible antimicrobial use
- **Regulatory measures:** Enforcing policies based on data

# Auditing of Antimicrobial Prescribing Practices

- Regular audits of prescribing practices can help AMS teams:
  - Identify the appropriateness of prescribing
  - Monitor the effectiveness of an intervention
  - Provide feedback to all stakeholders in individual or group education sessions

- Point prevalence surveys can be conducted to guide antimicrobials use at primary, secondary, and tertiary level

- Healthcare providers at all levels of care, can conduct antimicrobial prescribing audits and clinical pharmacists (where available) should spearhead this process

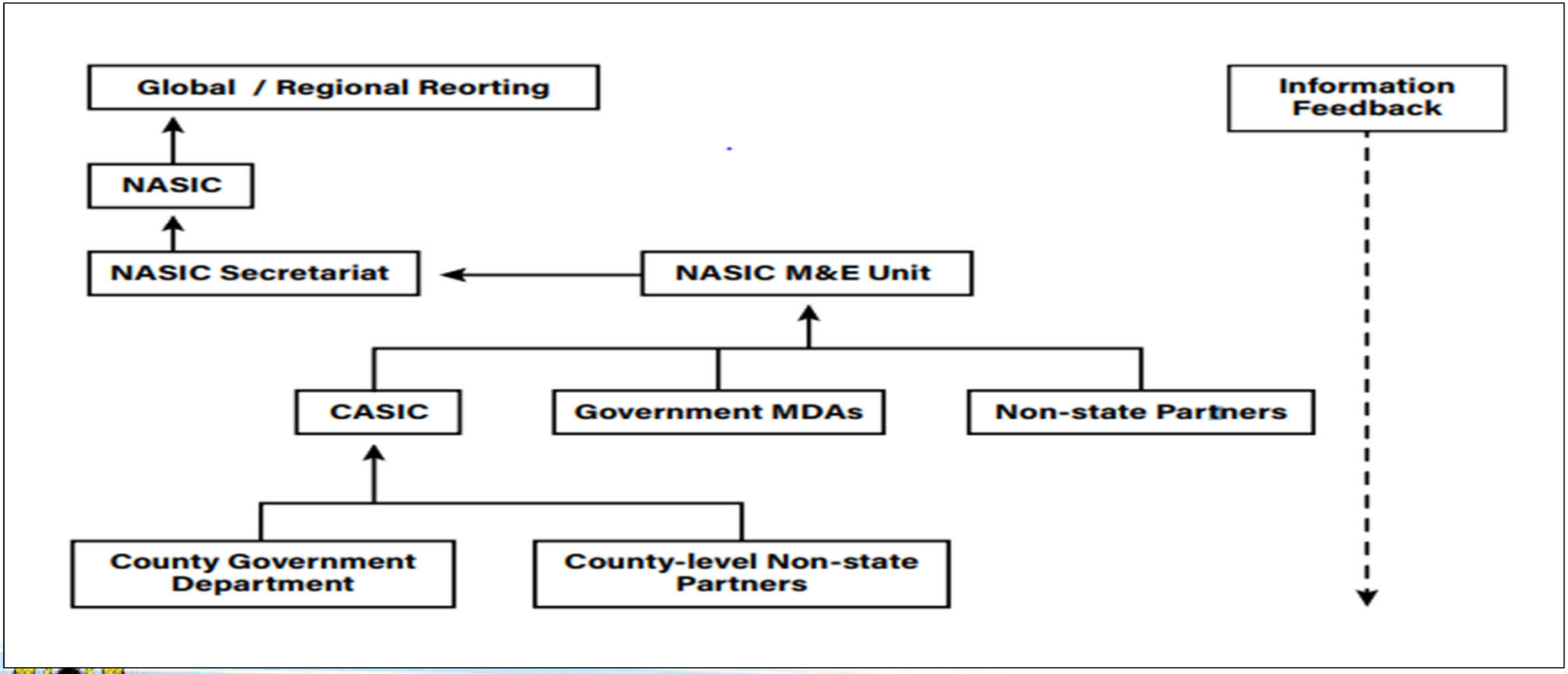
# Reporting, Feedback and Use of Data

- Data collected on antimicrobial use should be analysed and shared across different levels
- Should also be shared with other sectors and with the public
- Allows for interrogation, comparisons, learning and benchmarking
- Also allows for global comparisons of antibiotic use

# Reporting, Feedback and Use of Data….

| Level | Use of surveillance Data | Impact of Outcome |
|---|---|---|
| **Global.** | • Inform strategies to prevent and contain antimicrobial resistance, including the response to the Global Action Plan on Antimicrobial Resistance | • Coordinated efforts internationally avoidance of duplication of effort and inefficient use of resources |
| **National.** | • Inform policy and program development<br>• Develop and revise guidelines<br>• Inform public health priorities<br>• Inform regulatory decisions<br>• Coordinate, where necessary, the response to critical antimicrobial resistances. | • Coordinated and integrated efforts across the country.<br>• Increased awareness of antimicrobial resistance and the One Health Approach. |
| **County.** | • Inform policy and program development.<br>• Develop and revise guidelines.<br>• Inform public health priorities.<br>• Inform regulatory decisions.<br>• Detect and respond to critical antimicrobial resistance and outbreaks. | • Improved Knowledge of local antimicrobial resistance profiles.<br>• Timely response to emerging resistance.<br>• Appropriate and effective use of antimicrobials. |
| **Health Facility.** | • Inform critical practice.<br>• Inform policy development.<br>• Develop local strategies to improve antimicrobial stewardship.<br>• Detect and respond to outbreaks of resistant organisms. | • Appropriate and effective use of antimicrobials<br>• Improved capacity for timely response to emerging resistance. |
| **Individual.** | • Raise awareness of appropriate use in the community. | • Appropriate use of antimicrobials as prescribed.<br>• Decreased complication form unnecessary or inappropriate antimicrobial therapy. |

# AMS Data Flow



# Stepwise Approach to Assessing an AMS Program

**Step 1: Establish the Assessment Objectives and Scope**

- Define the purpose & scope

**Step 2: Select an Assessment Tool or Framework**

- WHO AMS Toolkit for Health Facilities, CDC Core Elements of Hospital ASP, Infection Prevention and Control Assessment Framework (IPCAF)

**Step 3: Conduct a baseline assessment**

- Establish the gaps by evaluating each Core Elements of the ASP
- Conduct On-Site Observations and Interviews

**Step 8: Develop an Action Plan**

- Identify Strengths, Gaps, and Prioritize Recommendations
- Set SMART objectives (Specific, Measurable, Achievable, Realistic, Time-bound)
- Develop indicators to measure extent of implementation

**Step 9: Monitoring Implementation**

**Step 10: Feedback and Stakeholder Engagement**

# Key Points

1. The goal of monitoring and evaluation of AMS programs is to identify improvement opportunities and assesses intervention impact.
2. Monitoring of AMS programs can be done using structural, process, outcomes,balancing and qualitative indicators.
3. Surveillance of AMS programs informs policy development, regulatory action, and public awareness.
4. Auditing and reporting of AMS programs ensures transparency and encourages stakeholder feedback and action.
5. Steps for assessment of AMS programs entails establishing the objective and scope, conducting baseline assessments, development of an action plan, defining indicators, monitoring implementation, and feedback and stakeholder engagement.

# The End


***You have come to the end of this module. Kindly attempt module 7 quiz before proceeding to module 8***