ReAct


# HANDBOOK FOR DATA COLLECTION

*As part of the Indicator Framework for 'Antibiotic Smart Communities'*






## ABOUT ReAct

Founded in 2005, ReAct is one of the first global networks to articulate the threat of antibiotic resistance and the complex nature of its drivers. Since 2005, ReAct has been working as a catalyst to stimulate and engage a broad range of organizations, individuals, and stakeholders at global, regional, national, sub-national and community levels for action on antibiotic resistance related issues. ReAct's special focus is on helping low and middle-income countries respond effectively and viably to the challenge of antibiotic resistance based on scientific evidence and global experience. ReAct has five regional nodes, spread across various continents. ReAct Asia Pacific, is based at Christian Medical College, Vellore, India. ReAct Asia Pacific has been working with various stakeholder groups to create templates for community-owned action on antibiotic resistance. It also focuses on translating evidence for public consumption and grooming 'Antibiotic Resistance champions' in various sectors.

This handbook serves as a step-by-step guide to use the indicator framework developed by ReAct Asia Pacific (RAP) as part of the 'Antibiotic smart communities' (2018-2022) project.

The lead for the project was RAP's former Deputy Director, Dr Philip Mathew under the guidance of RAP's Director (Dr. Sujith J Chandy). RAP members, especially, Mr. Satya Sivaraman, Dr. Jaya Ranjalkar and Dr. Hyfa Mohammed Ali contributed to the project.

This is the second and revised edition of the handbook. Although based on the first one, it is thoroughly revised for technical content based on the feedback obtained upon piloting the first edition in four more communities across India. The authors of this version are Dr. Jaya Ranjalkar (Deputy Director) and Dr. Jasmine Ruth Baluja (Lead - Supporting State Action Plans). We greatly acknowledge the inputs by the following members:

- Dr. Sujith J Chandy (Professor, Department of Pharmacology and Clinical Pharmacology, Christian Medical College, Vellore) for overall guidance and critical inputs.
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- Dr Premila Wilfred (Assistant Professor, Department of Pharmacology and Clinical Pharmacology, Christian Medical College, Vellore) for her inputs.

For more details visit about ReAct visit our website https://www.reactgroup.org/

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ReAct – Action on Antibiotic Resistance

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**A List of 15 Indicators**



## LIST OF ABBREVIATIONS

| | |
|---|---|
| **ABR** | Antibiotic Resistance |
| **AMR** | Antimicrobial Resistance |
| **ARG** | Antibiotic Resistant Genes |
| **ASC** | Antibiotic Smart Community |
| **AWaRe** | Access, Watch and Reserve |
| **BCG** | Bacillus Calmette Guerin |
| **HCF** | Healthcare Facility |
| **IHHL** | Individual Household Latrine |
| **JMP** | Joint Monitoring Programme |
| **LMIC** | Low and Middle Income Country |
| **LSGD** | Local Self Government Department |
| **MHM** | Menstrual Hygiene Management |
| **OTC** | Over the counter |
| **SDG** | Sustainable Development Goals |
| **UNICEF** | United Nations International Children's Emergency Fund |
| **WHO** | World Health Organization |
| **WASH** | Water Sanitation and Hygiene |

Chapter
# 01

# INTRODUCTION



## Antibiotic Resistance as a global priority

Antibiotic Resistance (ABR) is a global health threat with dire consequences. In 2019, 4.95 million deaths were associated with bacterial AMR and 1.27 million deaths were attributable to bacterial AMR.

ABR could result in increased incidence of treatment failure, prolonged hospital stays, increased healthcare expenditure, and increased mortality. There are other potential impacts such as lower yields in food animal production, increased cost of farming, and a possibility of causing global food insecurity. The impact of ABR could be much more pronounced in low-middle income countries (LMICs) due to many other contributing factors. The occurrence of ABR is hastened by several factors – primarily related to the irrational use of antibiotics in human and animal health sectors, besides environmental contamination (due to inappropriate disposal of antibiotics). Therefore, some of the strategies for ABR containment include – rational use of antibiotics in human and animal health sectors; infection prevention measures such as vaccination (to prevent infections in the first place and thereby the need of using antibiotics); and appropriate disposal of pharmaceutical waste. It is also widely accepted that ABR can affect the achievement of sustainable development goals (SDGs) due to its multisectoral nature.

In LMICs such as India, it is difficult to generalise ABR levels for rolling out systematic containment measures. Contexts and factors affecting ABR are often different in urban and rural communities, government and private healthcare facilities. A one-size-fits-all approach may therefore not be enough for such a large country. Extensive adaptation of containment measures is needed, taking into account the socio-cultural factors, systemic capacities and development indicators. A complementary approach with decentralised planning of interventions adhering to the spirit of implementation research is needed to ensure

success. A community-owned and community-led bottom-up approach is the need of the hour to ensure on ground changes in reducing ABR drivers and supporting ABR mitigation efforts.

### The Need for Antibiotic Smart Communities

In an era of greater democratic decentralisation, it is pertinent to have local governance structures and local communities co-opted into any action to contain multi-sectoral issues such as ABR. Most of the LMICS have some form of local governance mechanisms wherein certain authority is vested with local institutions in aspects such as healthcare delivery, agriculture and environment protection. All these sectors are critical for actions to contain ABR.

ReAct Asia Pacific (RAP) conceptualised the 'Antibiotic Smart Communities (ASC)' project with an aim of increasing competencies on the issue of ABR among local communities and local self-government institutions. RAP therefore decided to focus on enabling communities and local self-governments to understand the issue well enough so as to build a community coalition around the issue.

Initial work on the ASC project started in 2018 with multiple consultative meetings with stakeholders, discussions with local leaders, and the gathering of relevant baseline data. RAP anchored the activities in close collaboration with the local self-government institution and influential socio-religious groups, and a local community development organisation to ensure robust community support and buy-in for the interventions. The entire population living in the catchment area of a local self-government institution (Panchayat) was considered as a community for the purposes of this project. This definition was used because similar local self-government structures are present in most LMICs (although there may be differences in size and mandate).

### Designing and piloting an indicator framework for 'Antibiotic Smartness'

Defining 'antibiotic smartness' is a challenge when engaging local communities. An objective criterion to measure the level of ABR preparedness can better help in planning interventions and quantifying the results. Without such quantitative/objective strategies, it would be difficult to convince the local self-government institutions to invest in action towards solutions. Therefore, a multi-stage process was devised to develop an indicator framework for measuring 'antibiotic smartness' of communities in LMIC contexts.

The insights gathered through the community engagement exercises were condensed and deliberated during three expert consultations in 2019, one each for public health professionals, veterinary/agriculture experts, and environment/development practitioners. The full list of sustainable development goal (SDG) indicators was also discussed during these consultations to explore whether some of the indicators could be repurposed for measuring ABR preparedness. Experts were also asked to suggest new indicators which are reflective of the ABR drivers with a potential to create impact on the ground. An exhaustive list of 34 indicators along with measurement strategies was framed at the end of the process.

The 34 indicators underwent a prioritisation process with inputs from 20 selected experts, globally. The experts looked at the following aspects of each indicator:-(i) appropriateness of the indicators in measuring ABR, (ii) specific/sensitive activities in local communities, (iii) feasibility of measurement in LMIC contexts, and (iv) validity of the indicators in detecting changes on the ground.

A final framework of 15 indicators as shown in Table A, covering human health, animal health, hygiene, environment, development, and trans-sectoral domains was agreed upon after discussions within ReAct Asia Pacific and with local partnering agencies. The indicators and the methodology of applying them to measure the 'antibiotic smartness' of any community (on a standard scale) is explained in this handbook. Each indicator has a methodology for measurement and rationale for categorisation, and can have a score between 1 to 3. Consequently, communities score anywhere between 15 to 45 given that there are 15 indicators in the framework. Communities with scores closer to the maximum are considered to be 'antibiotic smart'.

TABLE A: **LIST OF 15 INDICATORS**

| Sl. No: | Indicator | Domain |
|---|---|---|
| 1. | Availability of Hygiene facilities in primary and secondary schools in the community | Trans-sectoral |
| 2. | Proportion of households having access to Individual Household Latrine (IHHL) with water supply, within the premises of their house | Trans-sectoral |
| 3. | Coverage for paediatric vaccines listed in the immunization schedule published by the competent national authority | Human Health |
| 4. | Percentage of Access antibiotics (as per AWaRe classification of WHO) in total antibiotics dispensed in out-patient settings at healthcare facilities | Human Health |
| 5. | Proportion of healthcare facilities with a written antibiotic protocol for at least three disease/syndrome conditions caused by bacteria | Human health |
| 6. | Over-the-counter availability of antibiotics in retail pharmacies in the area | Human Health |
| 7. | Proportion of population using safely managed drinking water services | Human Health |
| 8. | Use of Highest Priority Critically Important Antibiotics in agriculture | Food animal |
| 9. | Presence of veterinary health facilities in the community | Animal Health |
| 10. | Availability of veterinary laboratory services for disease diagnostics | Animal Health |
| 11. | Educational initiatives in the last one year to increase awareness about antibiotic or biocide use among farmers | Livestock and Agriculture |
| 12. | Biomedical waste management system in healthcare facilities | Environment |
| 13. | Proportion of wastewater treated using any established wastewater treatment technologies, as per WHO's guidelines on Sanitation & Health | Environment |
| 14. | Farm waste contaminating water resources in the community | Environment |
| 15. | Use of chemical/synthetic pesticides, herbicides, and other biocides in farms | Environment |

Chapter

# 02



### *2.1 Key terminologies and instructions before beginning data collection*

This chapter lists common terminology encountered in the indicator framework described below. The meaning of some of the terms can be highly contextual and it is necessary to ensure that the definition is applied consistently throughout the activity. Listed below are some of the definitions that are applicable for this handbook:

**Community:** A limited geographical area governed by the smallest unit of governance. It can be linked by social, economic, and/or cultural ties; and share a common leadership or governmental structure.

A group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings.

The ASC project is implemented at the lower end of the governmental/ administrative spectrum, including towns, villages, and hamlets.

Household: Household is a person or group of persons that usually live and eat together from the same pot, not necessarily related by birth.

**Healthcare Facility:** It can be broadly stated as any institution that has a qualified doctor and provides health service. This can include primary health centres (PHCs), hospitals, dental clinics or any healthcare clinic where modern medicine is practiced etc.

**Agricultural Farm:** Any plot of land used for commercial production of agricultural products including fruits, vegetables, crops etc.

**Animal Husbandry:** Rearing of domestic animals for commercial purposes. This may include but not limited to activities such as dairy farming, poultry farming and aquaculture.

**Veterinary Health Facilities:** An establishment where domestic animals are admitted for examination and treatment by one or more veterinarians, and which may include accessory boarding on a temporary basis.

**Veterinary Paraprofessionals:** A person who, for the purposes of the terrestrial code, is authorized by the veterinary statutory body to carry out certain designated tasks (dependent upon the category of veterinary paraprofessional) in a territory, and delegated to them under the responsibility and direction of a veterinarian (as per OIE Terrestrial Animal Health Code 2).

Pharmacy – A setup that is authorised (approved by the government and has a designated pharmacist) to sell medicines (including antibiotics) among other products.

### *2.2 List of things to do before beginning data collection*

- Define the community where the project is to be carried out.
- As sensitive data corresponding to different stakeholders (community members, hospitals, patients etc) has to be obtained, it is important to ensure confidentiality.
- Meet the local leaders of the community. Explain the concept, the processes and collaborate with all relevant authorities in the community before starting the project. This will also help to design suitable interventions at a later stage when the framework is applied and key ABR drivers identified.
- Collect and document the background details of the community:
- Province:
- Subdivisions:
- Population in the villages under study: Area (in sq km) of the study area
- Literacy rate in the area:
- Primary occupations:
- Dominant religion/caste:
- Main health problems in the area:
- Infant Mortality Rate (IMR)
- Socio-economic issues in the area:
- Prepare a list of following:
- Healthcare facilities in the area
- List of Farms in the area- diary, poultry, aquaculture and agricultural crops
- List of Pharmacies in the area
- List of veterinary centres in area
- A list of administrative divisions in the area
- List of schools in the area
- The project team and the data collector have to ensure that confidentiality is maintained. All the facilities included in the data collection are allocated a code to maintain confidentiality. The data collector is advised to document all the original data elsewhere for maintaining a record of which facility/school/farm corresponds to which code.
- Care has to be taken to ensure appropriate randomisation so that data is truly representative of the community in context. For example, while selecting farms, care has to be taken to ensure different types of farms are included (such as poultry farms, fisheries, shrimp farms if these are there in the community). Similarly for household data, if one house was included for indicator on hygiene, another house has to be visited for other indicators to ensure good representation.
- Similarly for healthcare facilities, efforts have to be taken to ensure all levels of healthcare – such as primary, secondary and tertiary are represented.
- For indicators needing a qualitative approach, it is the responsibility of the project team to analyse and interpret the interviews in liaison with the data collector, and then jointly allocate the final score.

Chapter
# 03

## DATA COLLECTION METHODS



**PRIMARY DATA COLLECTION:**

- Primary data collection as a door-to-door survey process from households and farms.
- Primary data collected with the help of service providers and beneficiaries in veterinary centres, pharmacies, and schools.

Suitable methods are employed based on the indicator reference sheets.

**SECONDARY DATA COLLECTION:**

For a couple of indicators, secondary data may be available as part of national data or data from local self-government departments or health care facilities in the area (such as indicator on immunisation coverage). In case secondary data is unavailable or it is felt that data may not representative of the particular community in context, then primary data should be obtained by the data collector based on the respective guidelines.

### *3.1 GUIDELINES FOR DATA COLLECTION*

1. Data collection and sampling technique for household data

- A list of administrative divisions located in the study area is prepared by the data collector. Using a random-number generator mobile application, three divisions are randomly selected.
- The data collector visits the geographical centre of the selected divisions and chooses a specific direction using a lottery method or by spinning a bottle or using any available mobile application for generation of random directions.
- On selection of the direction, the last digit of the first currency note taken by the data collector from their own wallet is noted (nth number) as the sampling interval.
- The data collector visits the house chosen and subsequently every nth house until the sample size of 30 is

attained.

- In case the chosen direction ends before completing 30 houses, the data collector is advised to return to the centre and repeat the process. If the house is locked or the consent is denied, it should be noted on the data collection sheet and subsequent houses should be visited. In situations wherein a lane or pocket road is present before completing 30 houses in the chosen direction, they are advised to enter the lane from their right side and every nth house is visited. If the lane ends before finishing the required sample size, they may return to the entry of the lane and continue in the initial direction. The process is repeated in each unit to obtain a total sample size of 30.

**2. Data collection and sampling technique for schools, healthcare facilities, veterinary hospitals, pharmacies, farms:**

- A list of schools, healthcare facilities (including dental clinics), veterinary hospitals, pharmacies, and farms is prepared by the data collector.
- Universal sampling (in which all facilities are included) is done when the sampling unit is 10 or less than 10.
- When there are more than 10, a list of each category is prepared, and 10 units are selected using a simple random technique using any randomisation method to attain the required sample size based on above principles.

**3. Data collection for indicators that require qualitative approach**

- For those indicators that require a qualitative approach, interviewee criteria are determined based on the indicator.
- A purposive sampling method is followed until data saturation is reached or no new themes emerge.
- The study participants include farmers, LSGD members, and agriculture extension workers. Identification of potential participants will be done using the help of community health workers or volunteers, local political leaders, or any other member from the community.
- The data is collected as observations (recording of what is seen, heard or encountered in detailed field notes) and short interviews (asking questions in one-on-one conversations).

***3.2 Suggested order in which data collection could be done for ease:***

***Indicators from Household Data***

- Indicator 2 - The proportion of households having access to Individual Household Latrine (IHHL) with water supply within the premises of their house [this could also be obtained from public data or primary health centre or any data as part of sub-national or national health surveys]
- Indicator 3 - Coverage for paediatric vaccines as per the national immunisation [this could also be obtained from public data or primary health centre or any data as part of sub-national or national health surveys]
- Indicator 7 - The proportion of population using safely managed drinking water services
- Indicator 13 - The proportion of wastewater treated using any established wastewater treatment technologies, as per WHO's guidelines on Sanitation & Health (2019)

***Indicators from Agricultural Farms and Veterinary Hospital***

Animal farms only

- Indicator 8 - Use of Highest Priority Critically Important Antibiotics in agriculture
- Indicator 14 - Farm waste contaminating water resources in the community

**Qualitative data:**

- Indicator 9 - Presence of veterinary health facilities in the community
- Indicator 10 - Availability of veterinary laboratory services for disease diagnostics
- Indicator 11 - Educational initiatives in the last one year to

increase awareness about antibiotic or biocide use among farmers

**Crop farms only**

- Indicator 15 - Use of chemical/synthetic pesticides, herbicides, and other biocides in farms

***Indicators from Healthcare Facilities***

- Indicator 4 - Percentage of Access antibiotics (as per AWaRe classification of WHO) in total antibiotics dispensed in outpatient settings at healthcare facilities
- Indicator 5 - Antibiotic protocols in healthcare facilities
- Indicator 12 - Biomedical waste management system in healthcare facilities

***Indicators from Schools***

- Indicator 1 - Access to gender-specific latrines with soap and running water.

***Indicator related to Pharmacies***

- Indicator 6 - Over-the-counter availability of antibiotics in retail pharmacies in the area.

***Note:*** *In the pages to follow, key terms, definitions and description of each of the 15 indicators is presented along with data collection methods (including sample selection) and data entry templates.*

INDICATOR
01

# HYGIENE FACILITIES IN PRIMARY AND SECONDARY SCHOOLS IN THE COMMUNITY



**Domain:** Trans-sectoral

**Indicator definition:**

Proportion of schools in the area having gender specific latrines with running water, soap and handwash facilities for students

**Description:**

- A short survey of at least 10 primary and secondary schools should be undertaken, with an aim to check whether gender-specific latrines with running water supply and handwashing facilities with soap are in place.
- If all the schools have gender specific latrines with running water supply and handwashing facilities with soap, the community is categorised as Good.
- If all the schools have gender specific latrines with water facility but without access to soap, it is Reasonable.
- If some schools have gender specific latrines but without running water or without handwashing facilities and soap or all schools have latrines with water and soap but common to all genders, it is categorised as Inadequate.

**Rationale:**

Water Sanitation and Hygiene (WASH) in schools presents a big challenge as acknowledged in the SDG indicators. Lack of access to toilets is a contributing factor behind (i) girl students discontinuing schools on attaining puberty and/or (ii) absenteeism during menstruation. Besides being a foundation for establishing a healthy learning environment, WASH is a contributing factor to hygiene and infection prevention in adulthood, reducing the likelihood of infections acquired in school environments, and forms an essential component for Menstrual Hygiene Management (MHM). Optimal access to high quality handwashing facilities is a determinant for infectious diseases in schools.

**Data Collection Method:**

- Prepare a list of 10 schools in accordance with the data

collection methods (chapter 2)

- The data collector has to visit the school after obtaining suitable permission from the concerned authorities and observes the criteria mentioned above
- Exclude gender specific schools such as exclusive girls or exclusive boys (unless there are no co-ed schools in the community, in that case include all or at least 10 schools and assess for water and soap facilities)
- Table 1 shows a sample data entry sheet to be used for data collection.

**TABLE 1** - Data Entry Sheet: Hygiene facilities in primary and secondary schools in the community

| Sl. No | School code | Nature (Public/private/ aided/special) | Category of School | Availability of gender specific Latrines (Yes/ No) | Availability of hand washing facility with soap & water (Yes/No) | Remarks if any |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| | | | | | | |



**Category of schools**

Lower Primary School - **A**

Upper Primary School - **B**

High School - **C**

Higher Secondary - **D**

***Categorisation:*** Based on the above data, the data collector must assess and give the community a categorisation of Good or Reasonable or Inadequate and identify and document the areas that need improvement.

INDICATOR
02

# ACCESS TO INDIVIDUAL HOUSEHOLD LATRINE (IHHL) WITH WATER SUPPLY (IN HOUSEHOLDS)



**Domain**: Trans-sectoral

**Indicator definition**:

Proportion of households having access to Individual Household Latrine (IHHL) with water supply, within the premises of their house.

**Description**:

- Secondary data from local self- government institutions and or other similar surveys
- If secondary data is not available, primary data through a short survey of 30 households selected using systematic random sampling methodology.
- If 100% households have access to IHHL, it will be categorised as All
- Any value between 51% to 99% will be categorised as Most
- Up to 50% will be categorised as Some

**Rationale:**

In LMICs, it has been demonstrated that lack of access to an improved latrine is significantly associated with incidence of diarrhoea and childhood mortality. Diarrhoea kills more people than HIV, Tuberculosis and Malaria combined; and more than 2 million deaths per year can be averted if everyone has optimal access to safe latrines and clean drinking water. The access to improved latrines has been increasing consistently across the developing world through various innovative methodologies and incentive schemes but remains far from 100%.

**Data Collection Method:**

**Secondary Data Collection:**

Existing data from the records of Local self-government departments or Health care facilities on access to Individual Household Latrine (IHHL) with water supply within the premises of their house is obtained.

Proportion of households having Individual Household Latrine with water supply within premises of the house based on the data from local self- government: .....

Alternatively,

Primary Data Collection:

If the data is not available with the concerned department, primary data should be collected by the data collector from 30 households, based on point 1 of the guidelines for data collection given in section 3.1.

**TABLE 2** - Data Entry Sheet: Availability of Individual Household Latrine with water supply within premises

| Sl. No: | Ward No: | House No: | Availability of Individual Household Latrine with water supply within premises (yes/no) | Remarks |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| . | | | | |
| . | | | | |
| . | | | | |
| . | | | | |
| 30 | | | | |



**Categorization:** All (3) Most (2) Some (1)

**Premises** - Public toilets should not be included

Two household sharing one latrine could be considered if from same family

INDICATOR
03

# COVERAGE FOR PAEDIATRIC VACCINES AS PER THE NATIONAL IMMUNISATION SCHEDULE



**Domain**: Human Health

**Indicator definition**:

Age appropriate coverage for paediatric vaccines in under-5 children as listed in the immunisation schedule published by the competent national authority

**Description**:

Secondary data to be collected from local self-government institutions or local health authorities.

- If the age-appropriate coverage of all vaccines listed in the national schedule is above 95%, it is categorised as High
- If the coverage of all vaccines is between 85-94%, it is categorised as Reasonable
- If at least one vaccine has a coverage of less than 85%, it is categorised as Low

**Rationale**:

Vaccines have a role in reducing the use of antibiotics and thereby slowing the emergence of AMR. For example, Haemophilus influenza Type B vaccine has shown efficacy in preventing fatal infections and thereby reducing the use of antibiotics in children. Therefore, a robust vaccination coverage among children could be associated with lower levels of antibiotic use.

**Data Collection**:

Existing data from the records of local self- government departments or health care facilities in the area should be obtained. If the data is not available with the concerned department, primary data has to be collected by the data collector based on the guidelines for household data collection. The data collector has to visit households that have children less than five years and ask parents/ caretakers about the vaccination status or alternatively check the immunisation card. The collected data can then be summarised and collated in a template as shown in Table 3.

**NOTE**: Different communities in different countries may have different policies and/or immunisation schedules. The data collector should be aware of the recommendations and vaccine choices that are in vogue in the community of interest.

**TABLE 3** - Data Entry Sheet: Age appropriate vaccination for Infants in the community

| Sl. No: | Vaccine | Age appropriate Coverage (%) | Remarks |
|---|---|---|---|
| 1 | Bacillus Calmette Guerin (BCG) | | |
| 2 | Pentavalent vaccine | | |
| 3 | Measles and Rubella | | |
| 4 | Any other Vaccine as a part of the schedule | | |

**Categorization**: High (3) Reasonable (2) Low (1)

INDICATOR
04

# PERCENTAGE OF ACCESS ANTIBIOTICS (AS PER AWaRe CLASSIFICATION OF WHO) AMONGST THE TOTAL ANTIBIOTICS DISPENSED IN OUT-PATIENT SETTINGS AT HEALTHCARE FACILITIES



**Domain**: Human Health

**Indicator definition**:

Percentage of Access antibiotics (as per AWaRe classification of WHO) amongst the total antibiotics dispensed in out-patient settings at healthcare facilities (HCFs)

**Description:**

- Data collected from 30 consecutive prescriptions with at least one antibiotic, dispensed from each healthcare facility. Similar, exercise has to be repeated for all the 10 healthcare facilities.
- Collect the prescription and document all the antibiotics.
- The percentage of Access, Watch and Reserve antibiotics should be calculated.
- If the proportion of Access antibiotics is 60% or above, the area will be categorised as High
- If the value is between 30% and 60%, it is Reasonable
- If it is less than 30%, it is Low

**Data Collection**:

- For preparing the list of 10 HCFs, refer to section 3.1. For standalone clinics and primary health care centres, there is no further categorisation. However, for secondary or tertiary care centres, it is preferable to include general medicine or community medicine or family medicine departments.
- Thirty consecutive prescriptions containing at least one antibiotic are collected and the antibiotic category is entered in the data sheet. If the prescription contains more than one antibiotic, the details and the category of each antibiotic must be noted. The investigating team

can coordinate with the healthcare centre for obtaining prescriptions and AWaRe categorisation, if needed. Data entry can be done using a template similar to the one shown in Table 4.

**Rationale**:

WHO had introduced AWaRe (Access, Watch and Reserve) classification of antibiotics in 2017, as a part of its Essential Medicines List. The objective was to ensure access to quality assured and affordable antibiotics to all; and ensure rational use of antibiotics. WHO also said that at least 60% of the overall antibiotic consumption at a country level should be from the 'Access' list. Some studies have shown that 'Watch' antibiotics are available and used more often than 'Access' antibiotics, in countries such as India.

**TABLE 4** Data Entry Sheet: Percentage of Access antibiotics (As per AWaRe classification of WHO) amongst the total antibiotics dispensed in out-patient settings at healthcare facilities

| **HCF Code** | | |
|---|---|---|
| **Sl. No.** | **Antibiotic** | **A/W/R** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| . | | |
| . | | |
| . | | |
| . | | |
| 30 | | |

Template to be printed for each facility [table to be replicated for 10 HCFs]. So, a total of 300 prescriptions with at least one antibiotic has to be collected presuming there are 10 HCFs in the community.

Percentage of prescriptions with an access antibiotic = (No of Access antibiotics prescribed/Total No. of antibiotic prescribed) multiplied by 100

**Categorization**: High (3) Reasonable (2) Low (1)

**Link for AWaRe classificatio**n

*https://www.who.int/publications/i/item/2021-aware-classification*

INDICATOR
05

# ANTIBIOTIC PROTOCOLS IN HEALTHCARE FACILITIES



**Domain**: Human health

**Indicator definition**:

Proportion of healthcare facilities with a written antibiotic protocol for at least three acute infectious disease/syndrome conditions of bacterial origin.

**Description**:

- A short audit of 10 randomly selected healthcare facilities for the presence of a written antibiotic protocol for at least three disease/syndrome conditions caused by bacteria.
- All healthcare facilities with a medical practitioner or administering injections will be included in the audit. Exhaustive sampling can be done if the number of HCFs is less than 10.
- Antibiotic protocols which have not been re-evaluated or revised in the last 5 years should not be considered.
- If the facility follows protocols based on the above two criteria, it will be considered as present.
- If 100% of health care facilities have a written antibiotic protocol for at least three acute infectious disease/ syndrome conditions in place, the categorisation is All
- If one or more healthcare facilities (but not all), categorisation used is Some
- If none of the healthcare facilities has a plan or system, it is categorised as None

**Rationale**:

Antibiotics are heavily prescribed in primary and secondary care settings in low-middle income countries. Though most of the prescribed antibiotics are from the access group (as per WHO's AWaRe classification), the increased use of antibiotics contributes to greater selection pressure in the environment. The impact of treatment protocols or standard treatment guidelines on streamlining care

for infectious diseases and reduction of antibiotic prescriptions has been well demonstrated in studies. Hence, regularly updated treatment guidelines form an important component of any antimicrobial stewardship efforts in healthcare facilities.

**Data collection method**:

- Prepare the list of 10 HCFs as explained in section 3.1
- The data collector visits the HCF after obtaining permission from the concerned authorities and observes the criteria mentioned above in order to obtain the required data
- If the protocol is written for less than three infectious conditions, then it is marked as absent. Only if the protocol mentions three or more conditions, it is marked as present. If the hospitals or centres have their own set of guidelines for infectious diseases, in that case also it can be marked as present.
- The exercise has to be repeated for all the chosen HCFs and the data can be summarised in a template as shown in Table 5.

**TABLE 5** - Data Entry Sheet: A written antibiotic protocol for at least three disease/ syndrome conditions caused by bacteria

| Sl. No: | Code of the Healthcare Facility | A written antibiotic protocol for at least three disease/syndrome conditions of bacterial origin (Present/Absent) | Details of the diseases/ syndrome's conditions (mention at least three) |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**Categorization**: All (3) Some (2) None (1

INDICATOR
06

# OVER-THE-COUNTER AVAILABILITY OF ANTIBIOTICS IN RETAIL PHARMACIES IN THE AREA



**Domain**: Human Health

**Indicator definition**:

Proportion of retail pharmacies dispensing 'Amoxicillin/clavulanic acid' without a prescription, for a person mentioning upper respiratory symptoms.

**Description**:

- The data collector visits 10 retail pharmacies to buy commonly used antibiotic 'Amoxicillin-Clavulanic Acid' for Upper Respiratory Infection. Exhaustive sampling is done if the number of retail pharmacies is less than 10.
- Classification based on the responses of dispensers for selling antibiotics without a prescription
- Up to 30% pharmacies, Poor OTC availability
- 31% to 80% pharmacies, Partial OTC Availability
- 81% or more, OTC freely available

**Rationale**:

Self-medication with antibiotics and over-the-counter sale of antimicrobial products exacerbate the ABR issue in many countries that have poor regulatory systems. This kind of antibiotic use is often irrational and contributes to the environmental selection pressure for development of resistance. There is ample evidence to show that higher consumption of antibiotics is associated with a higher incidence of resistance. This can be true for the individuals, community, and the country; and increase in consumption increases the probability of resistant infections. Therefore, measuring the over-the-counter antibiotic sales using surrogate markers has become an essential step.

**Data Collection**:

- For preparing the list of 10 pharmacies, refer to section 3.1.
- The data collector visits pharmacies and collects

data about antibiotic sale without prescription.

- Based on the community, Amoxicillin/ clavulanic acid could be replaced with another commonly used antibiotic such as azithromycin, if relevant evidence is available. However, the data collector should look for the same antibiotic in all the 10 pharmacies chosen.
- The data can be entered in a template similar to the one shown in Table 6.

**TABLE 6** - DATA ENTRY SHEET: Over-The-Counter availability of antibiotics in retail pharmacies in the area

| Sl. No: | Pharmacy code | Obtained 'Amoxicillin-Clavulanic Acid' for Upper Respiratory Infection over the counter (yes/no) | Remark if any |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**Categorization**: Poor OTC availability (3) Partial OTC availability (2) Free OTC availability (1)

INDICATOR
07

# ACCESS TO SAFELY MANAGED DRINKING WATER SERVICES



**Domain**: Human Health

**Indicator definition**:

Proportion of people using safely managed drinking water services.

**Description**:

- Short survey of 30 households selected using a random sampling methodology. WHO/UNICEF JMP definition for Safely managed drinking water services states - "Drinking water from an improved water source which is located on premises, available when needed and free of faecal and priority chemical contamination".
- If 100% households have access, it will be categorised as All
- Any value between 51% to 99% will be categorised as Most
- Up to 50% will be categorised as Some

**Rationale**:

The Global Action Plan on AMR mentions that better hygiene and infection prevention measures are needed to limit the transmission of antibiotic resistant microorganisms. Better food and water safety is an important pillar of infection prevention in the community. Poor quality of drinking water is associated with higher incidence of diarrheal illnesses and enteric fever in many developing countries; and these are independent risk factors for increased use of antibiotics. Also, there is increasing evidence that water has a role in propagating antibiotic resistance. In many cases, water also carries Antibiotic Resistant Genes (ARGs) bringing them to households. Septic tanks often act as genetic reactors for development of new resistance patterns. Therefore, quality of water is an integral component of any holistic intervention in controlling AMR.

**Data Collection**:

Primary data should be collected by the data collector from 30 households as per the procedure mentioned in section 3.1.

**Definition in WHO website:**

Improved drinking-water sources are defined as those that

are likely to be protected from outside contamination, and from faecal matter (in particular). Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collection.

Unimproved water sources include unprotected wells, unprotected springs, surface water (e.g. river, dam or lake), vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water.

The data can be entered in a template similar to the one shown in Table 7.

**TABLE 7** - Data Entry Sheet: Households with safely managed drinking water as per the definition

| **Sl. No:** | **House No:** | **Ward No:** | **Household with safely managed drinking water as per the definition (Yes/No)** | **Remarks** |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6. | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
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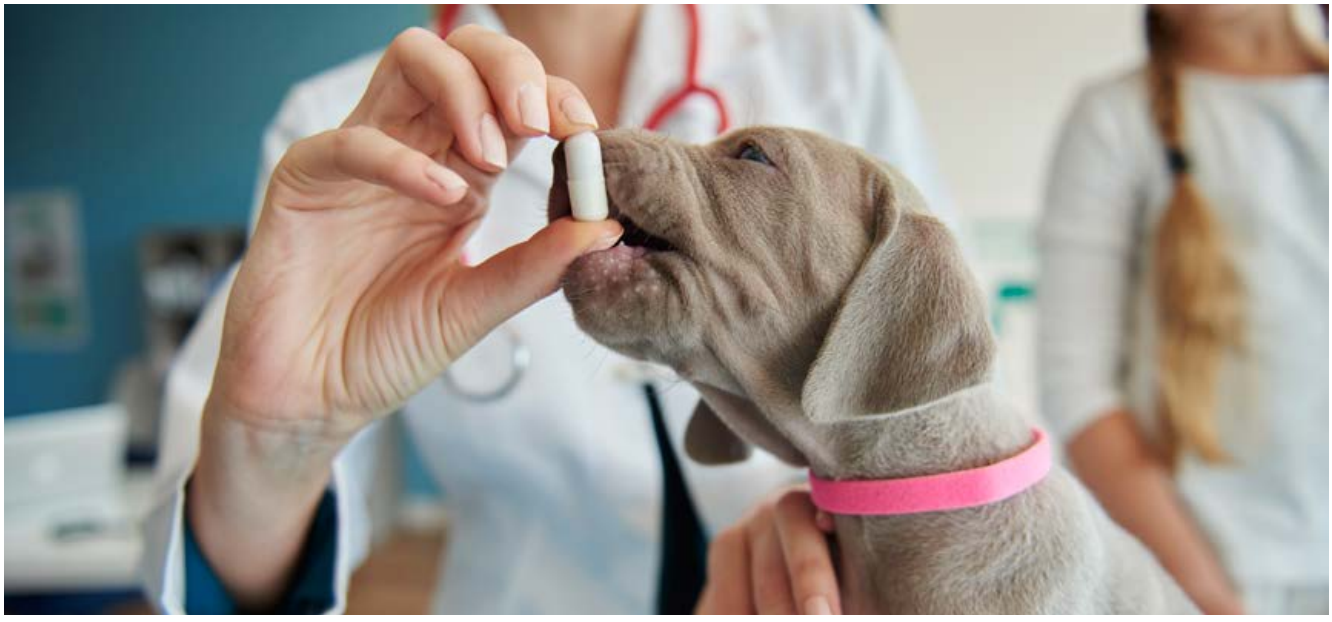
| 26 | | | | |
| 27 | | | | |
| 29 | | | | |
| 29 | | | | |
| 30 | | | | |

**Categorization**: All (3) Most (2) Some (1)

INDICATOR
08

# USE OF HIGHEST PRIORITY CRITICALLY IMPORTANT ANTIBIOTICS IN FOOD ANIMAL SECTOR





**Domain**: Animal Health

**Indicator definition**:

Proportion of commercial farms using Highest Priority Critically Important Antibiotics for Human Health, as per classification published by World Health Organization

**Description**:

- Short survey of at least 10 farms, using a random sampling methodology.
- Ask the farmers, inspect the premises or look at labels (including feeds) for highest priority critically important antibiotics.
  - If use is found in 50% and above farms, the community should be labelled as High
  - 1-49% being labelled as Some
  - 0 being None
- Request the farmers to share details of all the feed/ supplement/additives/medicines that they use for farming.

**Rationale:**

The World Health Organization has been publishing a list of antibiotics since 2005 and classifying them into three categories based on their importance to human medicine. Critically important medicines in the list have been further sub-classified into Highest Priority and High Priority. Studies conducted in developing countries have demonstrated frequent use of Polymyxins, 3rd and 4th generation Cephalosporins and quinolones in animals, all of which are classified as Highest Priority Critically Important antibiotics for human medicine. This shows the need to assess and document the nature of antibiotic use in farms of a region.

**Data Collection**:

- For preparing the list of 10 farms, refer to guidelines in section 3.1.
- The interviewer asks the farmers or farm owner regarding the use of critically important antibiotics as well as observes the farm for the same (if possible) after obtaining consent.
- Tabulate the findings using a template similar to the one shown in Table 8.

**TABLE 8** - Data Entry Sheet: Use of Highest Priority Critically Important Antibiotics

| Sl. No: | Code | Type of farm (diary/poultry/ aquaculture) | Ingredients of the feed or supplement or additives or actual medicine | Mention the names of anti-biotics | Use of Highest Priori-ty Critically Important Antibiotics (present/ absent) |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

**Categorization**: None (3) Some (2) High (1)

INDICATOR
09

# PRESENCE OF VETERINARY HEALTH FACILITIES IN THE COMMUNITY



**Domain**: Animal Health

**Indicator definition**:

Presence of at least one functional veterinary health facility in the community.

**Description**:

- The information can be collected from farms, farmers' representatives, local self-government institutions and local agriculture extension workers.
  - If there is a veterinary centre with a qualified veterinarian, it is categorised as Fully Functional
  - If there are services of a veterinary extension worker and no qualified veterinarian, it will be categorised as Semi-Functional
  - Absence of a veterinary centre, veterinarian and extension workers should be taken as Not Functional

**Rationale**:

Robust access to veterinary professionals is essential to maintain the health of livestock and the livelihood of people who depend on them. Access to veterinary care can be limited by economic, geographic and knowledge-based barriers, even in the context of high income countries. In LMICs, there could be several individual, institutional, and systemic problems which complicate access to veterinary care, thereby affecting the productivity of farms. Some of this gaps between demand and supply can be bridged by veterinary para-professionals and community animal health workers. Several papers have argued for a comprehensive policy for human resource development in the veterinary sector in LMICs, with the goal of increasing access.

**Data Collection**:

- The indicator requires a qualitative approach. A purposive sampling method is followed until data saturation is

reached.

- The study participants include farmers' representatives, veterinary lab officials, local self-government officials or local leaders and local agriculture extension worker. A maximum of 10 informants could be included.
- The data collector has to collect data on whether there are veterinary facilities available in the designated community as per the criteria mentioned in the previous paragraph through informant interviews.
- If possible, the data collector can personally visit the facilities and confirm the above findings.
- Findings can be noted in a template similar to the one shown in Table 9.

**TABLE 9** - Data Entry Sheet: Presence of functional Veterinary Health Facilities and Services in the community

| Sl. No: | Informant Category (Farmer/ LSGD member/ agriculture extension worker) | Qualitative inputs on presence/ absence and quality of services and consistency | Remarks if any |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**Categorisation:** Based on the qualitative inputs received from informants and visit to the facility either by the data collector or by any team members of the investigating team, the lead of the project has to assign the final score.

Fully functional (3) Semi-functional (2) Not functional (1)

INDICATOR
10

# VETERINARY LABORATORY SERVICES FOR DISEASE DIAGNOSTICS



**Domain**: Animal Health

**Indicator definition**:

Presence of a formal system of collecting, transporting and analysing veterinary samples for disease diagnostics.

**Description**:

- The information can be collected from veterinarians, veterinary lab officials, farm managers, farmers, farmers' representatives, local self-government institutions and local agriculture extension workers.
- Identify if there are any facilities for sample collection from infected animals for further diagnosis and management. Also, identify if there are any labs that provide services for certifying food – as antibiotic free food or antibiotic residue free food etc.
  - If there is a system to collect samples of possible infections and sending those to the nearest lab (within the community ), it is categorised as Fully Functional
  - If some samples are sent through ad-hoc mechanisms (outside of the community), it is called Semi-Functional
  - If no provision is available to send samples, it is labelled as Not Functional

**Rationale**:

The food safety angle of AMR has been highlighted in several policy documents. This approach can potentially mobilise consumer advocacy groups and consumers; and can possibly translate to an increase in awareness of AMR among the general public. There are several certification systems available for food produced without routine use of antibiotics. Several large poultry producers have

adopted it and the system provides an independent verification system. Unfortunately, these systems are still not accessible to most small farmers from LMICs. Farmers can earn higher prices for their products made without routine use of antibiotics, only if properly linked to a certification system.

**Data Collection**:

- The indicator requires a qualitative approach.
- A purposive sampling method is followed until data saturation is reached or a maximum of 10 representatives.
- The participants could include veterinarians, veterinary lab officials, farm managers, farmers, LSGD member, or agriculture extension workers. Identification of the participants will be done with the help of community health workers or volunteers, local political leaders or any other member from the community.
- Findings can be noted in a template similar to the one shown in Table 10.

**TABLE 10** - Data entry sheet: veterinary laboratory services for disease diagnostics

| Sl. No: | Informant Category (Farmer/LSGD member/ agriculture extension worker) | Qualitative inputs on presence of mechanism for collecting, transporting and analysing veterinary samples | Remarks if any |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**Categorisation**: Based on the qualitative inputs received from informants and visits to the facility either by the data collector or by any team members of the investigating team, the lead of the project has to assign the final score.

Fully functional (3) Semi-functional (2) Not functional (1)

INDICATOR
11

# EDUCATIONAL INITIATIVES ON ANTIBIOTIC USE AMONG FARMERS



**Domain**: Livestock and Agriculture

**Indicator definition**:

Educational initiatives in the last one year to increase awareness about antibiotic or biocide use among farmers

**Description**:

- The information can be collected from farmers' representatives, local self- government institutions and local agriculture extension workers.
  - If there is a written plan for an educational campaign and at least three contact sessions were organised in the last one year, it is categorised as Fully Functional
  - If one or two sessions were organised and/or if a written plan is not prepared, it will be categorised as Semi-Functional
  - No contact sessions and/or no written plan, it is labelled as Not Functional

**Rationale**:

Educational initiatives directed towards various target groups are effective in reducing the use of antibiotics. However, some groups have deeply established views and behaviours on antibiotic use. This necessitates constant efforts to reinforce the messages on prudent use of antibiotics. Some studies have shown that inadequate knowledge among farmers result in poor practices related to antibiotic use in farms. Though very less literature is available in this regard, there is evidence to show that training of farmers is associated with reduced use of antibiotics in LMICs.

**Data Collection**:

- The indicator requires a qualitative approach.
- A purposive sampling method is followed until data

saturation is reached. The study participants include veterinary officials, farmer association members, farmers, LSGD member, agriculture extension workers.

- Identification of the participants will be done with the help of community health workers or volunteers, local political leaders or any other member from the community.
- Findings can be noted in a template similar to the one shown in Table 11.

**TABLE 11** -Data entry sheet: educational initiatives on antibiotics use among farmers

| Sl. No: | Informant Category (Farmer/LSGD member/ agriculture extension worker) | Remarks |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| | | |

**Categorisation**: Based on the qualitative inputs received from informants, one of the following categories is to be selected.

Fully functional (3) Semi-functional (2) Not functional (1)

INDICATOR
12

# BIOMEDICAL WASTE MANAGEMENT SYSTEM IN HEALTHCARE FACILITIES



**Domain**: Environment

**Indicator definition**:

Proportion of healthcare facilities with a biomedical waste management system in place.

**Description**:

- A short audit of the healthcare facilities to check the presence of a biomedical waste management plan or system. All healthcare facilities with a medical practitioner or administering injections will be included in the audit.
  - If 100% health care facilities implement biomedical waste management, the categorisation is All
  - If one or more (but not all) implement biomedical waste management, the categorisation used is Some
  - If none of the healthcare facilities implement biomedical waste management, it is categorised as None

**Rationale**:

Biomedical waste management is a public health priority as the waste generated from healthcare facilities can contaminate the environment and pose a threat to the health of people. However, in many LMICs, the level of awareness of Biomedical Waste Management Rules among healthcare workers appears to be low. This may reflect in the poor attitude and practices towards waste management in healthcare facilities. In some surveys, it was found that only around 30% of the health care workers seem to think that individuals also have a responsibility in biomedical waste management, and not just government

and hospital managements. One of the preliminary steps in improving adherence to waste management rules is to have proper plans in place in healthcare facilities and train all levels of staff.

**Data Collection**:

- For preparing the list of 10 HCFs, refer to point 2 of the guidelines for data collection in section 3.1.
- The data collector should visit the HCF after obtaining permission from the concerned authorities and observe whether the criteria mentioned above are met or not.
- Findings can be noted in a template similar to the one shown in Table 12.

**TABLE 12**- Data Entry Sheet: Presence of a Biomedical Waste Management plan or system

| Sl. No: | Institution Code | Biomedical waste management implemented (yes/no) | Remarks |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**Categorization**: All (3) Some (2) None (1)

INDICATOR
13

# TREATMENT OF WASTEWATER GENERATED IN HOUSEHOLDS



**Domain**: Environment

**Definition**:

Proportion of household wastewater treated using any established wastewater treatment technologies, as per WHO's guidelines on Sanitation & Health (2019)

**Description**:

- Data from local self-government institutions and/or through a short survey of 30 households selected using a random sampling methodology.
- The objective is to look at the percentage of wastewater generated from households which are safely treated.
  - If 100% wastewater is treated, it will be categorised as All
  - Any value between 51% to 99% will be categorised as Most
  - Up to 50% will be categorised as Some
- On-site facilities for treatment are also included in the assessment

**Rationale**:

Wastewater generated from households, farms and economic activities can be a potential public health threat, if not treated using scientific methods. Many waterborne diseases like diarrhoea and parasitic infections can affect the health of the community. Studies have also shown an increase in skin and reproductive tract infections in those exposed to untreated wastewater. Several aerobic and anaerobic methodologies have been used for treatment of domestic wastewater; and most of these technologies have high efficiency in retention of pathogens and recycling of nutrients. However, some of these are energy intensive and have obvious cost disadvantages. Therefore, most LMICs do not have centralised wastewater treatment plants and, therefore, domestic wastewater is used for minor irrigation

or as surface run-off, risking the water quality in the area.

On site wastewater containment storage/treatment step:

Sewage or faecal sludge is retained within the containment technology and/or discharged to the local environment in a manner that does not expose anyone to the hazard. This includes containment in an impermeable technology (such as a septic tank) or in a permeable technology such as a wet pit that leaches directly into the subsoil. At any point, it should not be discharged to an open drain or water body where, through contact or consumption, it could result in exposure of the local community and/or wider community to faecal pathogens.

As a general rule, in order to reduce the risk from contamination, the bottom of permeable containers and soak pit or leach fields should be no less than 1.5 m to 2.0 metres above the water table at its highest level during the year. Permeable containers and leach fields should be located down gradient, and at least 15 m horizontal distance from any drinking-water source (Banks et al., 2002; Graham & Polizzotto, 2013; Schmoll et al., 2006) (from the Guidelines on sanitation and health by WHO).

In case of impermeable containers, care should be taken during the conveyance of sludge to prevent leakage. Sludge from impermeable containers should be treated adequately before releasing to the environment using off site wastewater treatment techniques.

**Off-site water treatment techniques**:

Off-site water treatment technologies can be broadly classified into low flow rate or high flow rate. This is seen mostly in urban areas with a centralised sewage system. Data collectors are asked to check if the wastewater is not disposed-off or leaked into the environment before treating adequately at any certified facilities.

**Data Collection**:

***Secondary Data Collection***:

Existing data from the records of LSGDs on treatment of household wastewater is obtained for specific indicators.

Proportion of wastewater treated using any established wastewater treatment technologies, as per WHO's guidelines on Sanitation & Health (2019) as per the data from local self-government: .....

Alternatively,

***Primary Data Collection***:

- If the data is not available with the concerned department, primary data will be collected by the data collector from 30 households as described in section 3.1.
- Safe disposal of wastewater → Established water treatment technologies
- The data can be tabulated in a template similar to the one shown in Table 13.



**TABLE 13** - Data Entry Sheet: Household with safely treated wastewater

| Sl. No: | House No: | Ward No: | Household with safely treated wastewater (Yes/No) | Remarks |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| .5 | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |

| | | | | |
|---|---|---|---|---|
| 9 | | | | |
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| 28 | | | | |
| 29 | | | | |
| 30 | | | | |

**Categorisation**: All (3) Most (2) Some (1)

INDICATOR
13

# FARM WASTE CONTAMINATING WATER RESOURCES IN THE COMMUNITY



**Domain**: Environment

**Indicator definition**:

Proportion of commercial farms following standard guidelines and safe distance for disposing waste generated in food animal farming.

**Description**:

- A Short survey of at least 10 farms involved in food animal production, using a random sampling methodology.
- Ask the farmers about methods they follow to dispose of organic waste generated at their farms.
    - If 80% or more farms dispose their waste as per standards laid down by national governments or agencies at least 40 feet away from water bodies, the categorisation is High
    - If less than 80% of the farmers dispose of their waste at least 40 feet away from water bodies, the categorisation used is Some
    - If no farm is reporting scientifically sound disposal at least 40 feet away from water bodies, the area can be categorised as None

**Rationale**:

Waste management is not seen as a priority in many small farms and often the manure ends up contaminating the water resources around it. Farms discharge a lot of organic matter, agrochemicals, and drug residues into the environment; and unscientific agricultural intensification contributes to water quality degradation. The FAO states that around 38% of the water bodies in Europe are under threat from agricultural pollution. The situation may be much worse in LMICs. Studies have shown the presence of

multi-drug resistant bacteria in the farm environment that can easily spread into the water bodies. Manure from farms also contribute significantly to ABR as it serves as a medium for dissemination and a contributor to antibiotic selection pressure in the environment.

**Data Collection**:

- For preparing the list of 10 farms, refer to point 2 of the guidelines in section 3.1.
- The data collector has to visit the farm after obtaining permission from the concerned authorities and observe the criteria mentioned above.
- Findings can be tabulated in a template similar to the one shown in Table 14.

**TABLE 14** - Data Entry Sheet: Disposal of organic waste through standard methods at least 40 feet away from water bodies

| Sl. No: | Ward | Owner Code | Disposal of organic waste through standard methods or at least 40 feet away from water bodies (yes/no) | Remarks |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |

**Categorisation**: High (3) Some (2) None (1)

INDICATOR
13

# USE OF CHEMICAL/SYNTHETIC PESTICIDES, HERBICIDES AND OTHER BIOCIDES IN FARMS



**Domain**: Environment

**Definition**:

Proportion of agriculture – Grains/ vegetables/fruits or any local farming using chemical/ synthetic pesticides, herbicides, and other biocides for plant agriculture. Animal farms should not be included.

**Description**:

- Short survey of at least 10 farms to ask about use of pesticides, herbicides, and other biocides in their farms.
  - If 80% or more farmers have used any one biocide in the last one year, it is categorised as High
  - If between 20% and 80% of farmers' report use, it is categorised as Significant
  - If less than 20% of the farms report any use of biocides in the last one year, it is categorised as Low

**Rationale**:

There is evidence that use of biocides can also result in cross resistance to antibiotics and there is a need for greater stewardship of biocides. Though in some countries, there has been a marginal reduction in overall pesticide usage after introduction of Genetically Modified crops, this trend is not visible everywhere. There are several other healthcare issues, including cancer, which are associated with pesticide usage in crops. However, the average farmer in LMICs

tends to be unaware of the long term consequences of chronic pesticide exposure.

**Data Collection**:

- For preparing the list of 10 farms, refer to point 2 of the guidelines in section 3.1.
- The data collector has to visit the farm after obtaining permission from the concerned authorities.
- After obtaining consent, the data collector asks the farmers or farm owner regarding the use of chemical/ synthetic pesticides, herbicides, and other biocides, as well as observes the farm.
- Data can be tabulated using a template similar to the one shown in Table 15.

**TABLE 15**: data entry sheet: Usage of chemicals/synthetic pesticides, herbicides and other biocides in farms

| Sl. No: | Ward | Code and farm type | Name of the powder or chemical used | Composition | Use of chemical/synthetic pesticides, herbicides, and other biocides in farms (Yes/No) | Remarks |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

**Categorisation**: Low (3) Significant (2) High (1)

After obtaining the data corresponding to all the indicators mentioned above (using the templates given in tables 1-15, respectively), further analysis can be carried out to summarise the findings. The scores obtained in the previous sections have to be entered into a final tabulation sheet as shown in Table B below to obtain the final score for the community. The highest possible score is 45.

**TABLE B**: Final Tabulation Sheet for scores from 15 indicators and total score

| Sl. No: | Indicator | Categorization | | | Scoring based on Categorization |
|---|---|---|---|---|---|
| 1 | Hygiene facilities in primary and secondary schools in the community | Good (3) | Reasonable (2) | Inadequate (1) | |
| 2 | Access to Individual Household Latrine (IHHL) with water supply, in households | All (3) | Most (2) | Some (1) | |
| 3 | Coverage for pediatric vaccines as per the national immunization schedule | High (3) | Reasonable (2) | Low (1) | |
| 4 | Percentage of Access antibiotics (as per AWaRe classification of WHO) in total antibiotics dispensed in outpatient settings at healthcare facilities | High (3) | Reasonable (2) | Low (1) | |
| 5 | Antibiotic protocols in healthcare facilities | All (3) | Some (2) | None (1) | |
| 6 | Over-the-counter availability of antibiotics in retail pharmacies in the area | Poor OTC availability (3) | Partial OTC availability (2) | Free OTC availability (1) | |
| 7 | Access to safely managed drinking water services | All (3) | Most (2) | Some (1) | |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Use of Highest Priority Critically Important Antibiotics in Agriculture | None (3) | Some (2) | High (1) | |
| 9 | Presence of functional veterinary health facilities and services in the community | Fully Functional (3) | Semi-functional (2) | Not functional (1) | |
| 10 | Veterinary laboratory services for disease diagnostics | Fully Functional (3) | Semi-functional (2) | Not functional (1) | |
| 11 | Educational initiatives on antibiotic use among farmers | Fully Functional (3) | Semi-functional (2) | Not functional (1) | |
| 12 | Biomedical waste management system in healthcare facilities | All (3) | Some (2) | None (1) | |
| 13 | Treatment of wastewater generated in households | All (3) | Most (2) | Some (1) | |
| 14 | Farm waste contaminating water resources in the community | High (3) | Some (2) | None (1) | |
| 15 | Use of chemical/ synthetic pesticides, herbicides, and other biocides in farms | Low (3) | Significant (2) | High (1) | |
| Total score obtained out of 45 | | | | | |

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Notes


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